Washington Transportation Plan Update

Safety

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Executive Summary

Transportation safety is a paramount concern in all forms of transportation: airplanes, ferries, buses, trains, roadways, marine ports, bicycles, and pedestrians. The data tell us that roadway safety, including bicyclists and pedestrians, is our biggest concern, accounting for 600 annual fatalities. Because of this most of the discussion that follows is focused on understanding our roadway safety issue, followed by a brief summary of safety concerns of other modes. In addition, transportation system security is an area that has recently moved into the forefront of public concern.

What the data tells us

Despite declines, fatalities continue to be a serious problem

The number of deaths on Washington's roadways has declined over the past several years. Even so, more than 600 people die in collisions in Washington State each year – an unacceptable number despite our progress.

On Washington's highway system, collisions of all types (non-injury, other injury, disabling injury, and fatal) have gone up since 1980, from 34,662 in 1980 to 50,157 in 2002, an increase of 45 percent. However the fatality rate in the chart below has tended to steadily decline from 1915 forward.

The societal cost of motor vehicle collisions for all roadways (state, county, city, tribal, and federal) is estimated at $5.6 billion annually. Although fatal collisions make up only 2.5 percent of the total number of collisions, they account for 54 percent of the total societal costs.

By traffic volume, serious collisions occur most frequently on rural roads

A greater number of fatal and disabling collisions occur on state highways (1,714) than on city streets (1,289) or county roads (1,087). When the volume of traffic is taken into account, however, the rate (per 100 million vehicle miles traveled) of serious collisions that occur is greatest on county roads (12.4 per 100 million vehicles miles traveled), followed by city (9.2) streets, and then highways (5.4).

When looking at the data from an urban area versus a rural area, the *number* of collisions is about evenly divided. When the volume of traffic is examined, the *rate* of collisions per 100 million vehicle miles traveled is highest in rural areas.

Factors contributing to road related collisions, injuries, and deaths

Age

Young inexperienced drivers (16 – 20 years old) are the age group with the highest rate of fatal collisions. Fatal collisions begin to grow again with the over-71 age group. As the state's population ages, this will be a continuing concern.

Driver errors and behavior
The top three contributors in fatal accidents are: lane errors – 43%, alcohol – 30%, and speeding – 24%. ("Lane errors" is a broad category that includes, improper lane changes, merging and exiting, leaving the roadway, crossing into the path of on-coming traffic, etc.)

Not using seatbelts contributes to fatalities
Analysis of motor vehicle fatalities for 2002, when seat belt use in Washington was about 93% (the highest in the nation), shows that about half the persons who died were not wearing seat belts.

Motorcycle, pedestrian, and bicycle collisions
While the rate of all collisions involving motorcycles is only 1.4%, the percent of fatal and disabling collisions involving motorcycles is 12%. The number of pedestrian fatalities as a result of vehicle collisions has declined slightly since 1993. Even so, the number of pedestrian deaths (11% of all fatalities in 2002) remains disproportionate to the frequency they are involved in roadway collisions (1.4% of all roadway collisions). Of the 175 pedestrian deaths on state highways from 1996 to 2001, alcohol intoxication (for either driver, pedestrian or both) was involved in roughly one-third of the fatalities. The number of bicycle fatalities and disabling injuries compared to the number of crashes involving bicycles suggests that bicycle crashes with automobiles are of concern because they are so severe.

Roadway design
Features of the roadway may be a contributing factor in serious accidents. These features include access points along the roadway (driveways, intersections), objects along the roadway (trees, utility poles), curves (sight distance), and lane configuration (multiple lanes, median area, turn lanes). The conditions and circumstances that influence safety vary greatly between urban and rural aspects of the problem. In rural settings, "leaving the roadway" and "head-on collisions" are more likely, whereas in an urban setting, "hit at an angle" and "rear-end" collisions are more likely.

Safety issues for other modes

Rail transportation
Passenger rail transportation has a strong safety record with a national accident fatality rate of 0.08 per 100 million passenger miles, about 1/10 that of motor vehicles. Work remains to further improve rail safety, including rail crossings, trespassing, and oversight of light rail and monorail systems. Flashing lights and gates now protect nearly all crossings on busy main line tracks resulting in a 56% reduction in railroad crossing collisions since 1992. Trespassing and suicides on rail lines have resulted in 18 people killed in 2004, and four killed in collisions at rail crossings.

Aviation
General aviation has an excellent safety record in Washington. The national picture shows a fatality rate of .03 for 100 million miles flown. In recent years, general aviation has experienced about 51 accidents per year, with fatalities numbering in a range from 3 to 16 per year. The majority of general aviation collisions are the result of pilot error and weather.

Washington State Ferries

Washington State Ferries has a strong safety record in both its marine and terminal operations. It operates 28 vessels on 10 routes and carries over 25 million passengers annually. The United States Coast Guard sets safety standards for vessels and crew licensing. In 2002, there were 100 reported injuries to passengers on ferries—all of them minor in nature. There were 33 reported injuries at terminals—all minor in nature.

Transportation security

Terrorism activities have become an issue of public concern following the attack on the United States of September 11, 2001. As a result, transportation system security has become a focus of safety planning to deal with operational challenges that might be present in a terrorist emergency. Transportation system security includes: implementing protections to prevent harm to the transportation systems and their users; putting measures in place that deter terrorists from acting; and preparing to respond in the aftermath of a terrorist act.

Effectiveness of safety programs

Through collecting and tracking data, it has been demonstrated that many steps to increase safety are effective in lowering the toll of fatalities, injuries, and property damage on our roadways. These strategies focus on education, enforcement, and roadway conditions.

Intermediate drivers' license for young drivers

A law, passed in July 2001, requires an additional 50 hours of behind-the-wheel driving time for drivers under the age of 18 before they can obtain a license. It also limits the number and age of passengers in a vehicle and late night driving hours for young drivers.

Early statistics collected in the two years after the law began indicate a drop of 60% in the number of fatalities and disabling injuries for 16 and 17 year-old drivers.

Alcohol limit .08

The State Legislature enacted anti-drunk-driving laws in 1998 that lowered the blood alcohol intoxication standard from 0.10 to 0.08 percent and provided for automatic loss of licenses for drunk drivers. Prior to about 1998, a significant drop had been seen in the rate of alcohol related traffic fatalities. Since 1998, however, in Washington the trend mirrors the nationwide picture where the rate of alcohol related traffic fatalities has remained steady. Meanwhile, the nationwide rate has increased slightly from the year of its best performance (1998). In 2002, the rate of driver alcohol impairment associated with motor vehicle fatalities was 40%. This data is puzzling in view of the broad perception that the lowered alcohol threshold would, or has, spurred improvement in the drunk driving situation. More investigation is required before WSDOT can confidently suggest the meaning of these data.

Other measures taken in Washington to reduce drunk driving include requiring offenders to use ignition interlock devices (a device attached to the car's ignition system that requires the driver

to blow into the device before starting the car—if alcohol is detected the car won't start) and a crackdown on deferred Driving Under the Influence (DUI) prosecutions.

Seat belts and the "Click it or Ticket" Program

Washington's strong policies and enforcement of the seat belt law resulted in a high of 93% seat belt use in 2002 and increased to about 95% in 2003 and 2004. Half of the fatalities of motor vehicle occupants are people who were among the 5% to 7% of non-seat belt users.

Maintenance and operations of the roadway

Maintaining and operating highway systems makes a critical contribution to roadway safety. Day-to-day maintenance activities—including snow and ice control, debris removal, guardrail repair, traffic signal maintenance and repair—help reduce the conditions and circumstances that can lead to collisions. Two elements of operations—Incident Response Teams and Traveler Information Systems—play a key role in highway safety. Incident Response Teams help clear the road and direct traffic when incidents happen and reduce the risk of secondary collisions in the backup. Traveler Information Systems provide motorists with real-time traffic information that allows them to make informed travel decisions.

Roadway design and construction

Safety improvements are incorporated in WSDOT projects in many different ways—from the major improvement projects that add lanes or build interchange connections—to small projects that add a left-turn lane to address a specific problem.

Responsibility for programs and projects in the highway safety area is widely shared. At the state level, the Washington Traffic Safety Commission is a consortium of local and state organizations responsible for reducing death, injuries, and economic losses resulting from motor vehicle collisions. All of these groups, associations, and public agencies work together not to prevent all traffic collisions, but to make them more survivable.

Emerging directions

- Behavioral approaches will be a significant part of the strategy to address impaired driving, seat belt use, speeding, aggressive driving, and other contributing driver behaviors. WSDOT and the Washington Traffic Safety Commission are working together to evaluate the effectiveness of potential behavioral countermeasures.
- Roadway Environment - safety conditions on rural two-lane roadways can and should be addressed. Strategies such as increased enforcement, centerline and edge rumble-strips, and improved shoulders and roadsides are being evaluated. Also, cable median barriers and rumble-strips on Interstates are proving to be cost-effective solutions.
- Pedestrians, bicyclists, and motorcyclists are disproportionately represented in fatality rates and need to be addressed in the safety strategy.
- Stepped up efforts to prevent railroad trespassing, such as Operation Lifesaver, are needed.
- Improved weather information access at general aviation airports will help pilots make good flight decisions.
- Better understanding of data should help target safety efforts where they will have the most effect.

Introduction: Is Highway Safety Still An Issue?

Highway safety is a major issue for highway system users. This issue extends not only to motor vehicle drivers and passengers (including motorcyclists) but also to pedestrians and bicyclists, who incur injury at high levels on the Washington State roadway system.

While progress has been made since the late 1970s and early 1980s, when the death toll was close to 1,000 lives per year, accidents on Washington roadways still claim the lives of approximately 600 individuals each year. In addition, the number of fatal accidents is compounded by a much larger and increasing number of non-fatal vehicle accidents resulting in serious injuries and property damage.

Recent public concern over transportation system security coupled with continuing fatalities on roadways warrants increased attention to highway safety planning in the Washington Transportation Plan (WTP).

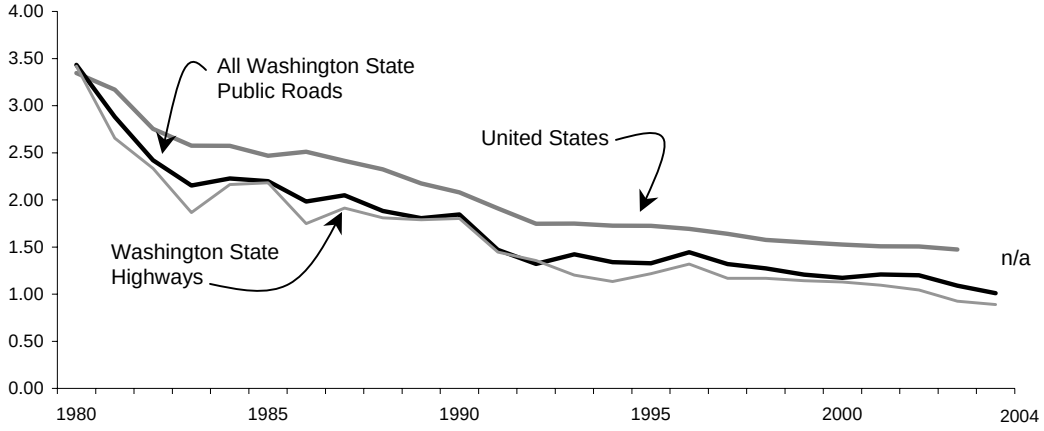
Responsibilities for Highway Safety

Responsibility for programs and projects in the highway safety area is widely shared. At the state level, the Washington Traffic Safety Commission is a consortium of local and state organizations responsible for reducing death, injuries, and economic losses resulting from motor vehicle collisions. It is in many respects a state level counterpart to the United States Department of Transportation's National Highway Traffic Safety Administration. Law enforcement on the highways is within the province of the Washington State Patrol (WSP) as well as local law enforcement agencies. Other public safety agencies, including local fire departments, have responsibility for swiftly responding to traffic incidents and increasing public awareness about traffic safety. Roadway maintenance and construction falls to the Washington State Department of Transportation and to city and county highway departments and public works departments. The Washington State Department of Licensing is responsible for testing and licensing of drivers. Schools, parents, driver education schools and even the state American Automobile Association help teach driving skills. Citizen health that includes traffic safety related issues is the concern of the Washington State Department of Health and the Department of Social and Health Services. Specialty groups such as the Washington Trucking Association and the Bicycle Alliance of Washington add to the mix of safety promoters. All of these groups, associations, and public agencies work together not just to prevent traffic collisions, but to make them more survivable.

History of Motor Vehicle Fatalities in Washington State

Although the current annual total of motor vehicle fatalities on Washington roadways has decreased by nearly half of what it was at its peak in 1979, the number remains high. Preliminary numbers suggest that for the first time since 1961, the total number of fatalities in 2003 dipped below 600.

Motor Vehicle Fatality Rates in Washington Compared to the National Average*
Fatalities Per 100 Million VMT: 1980-2004



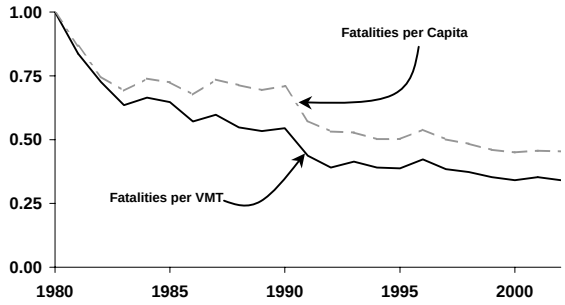
Sources: US Fatalities/VMT: NHTSA Traffic Safety Facts; WA Fatalities: FARS; State Hwy Fatalities: WSDOT-TDO; WA VMT: WSDOT-TDO
**2004 US Fatality Rate is not yet available.*

Since 1980, Washington State motor vehicle fatality rates per 100 million vehicle miles traveled (VMT) have been slightly lower than the national average while remaining relatively consistent with the downward national trend.

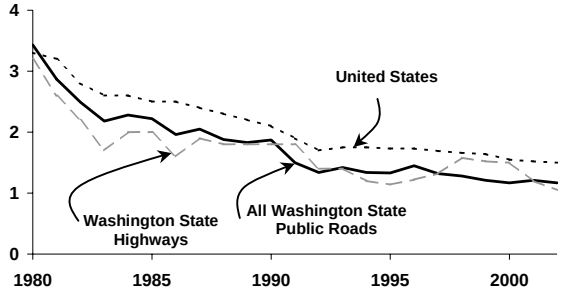
The graph to the right illustrates the percent decline in fatality rates per 100 million vehicle miles traveled (the solid line) and the percent decline in the rate of fatalities per capita (the dashed line). Since the vehicle miles traveled (VMT) has increased nearly twice as fast as Washington's population has grown, the decline in the annual fatality rate per VMT is more pronounced than the decline in fatality rate per capita.

When compared to the rest of the United States in 2002, Washington was ranked 9th for fewest traffic fatalities in relation to population and 10th in relation to vehicle miles traveled. While the national average was approximately 15 traffic fatalities per 100,000 people Washington's average was only 11. The graph below illustrates how Washington compares to the rate of fatalities per capita in the other 49 states in the nation.

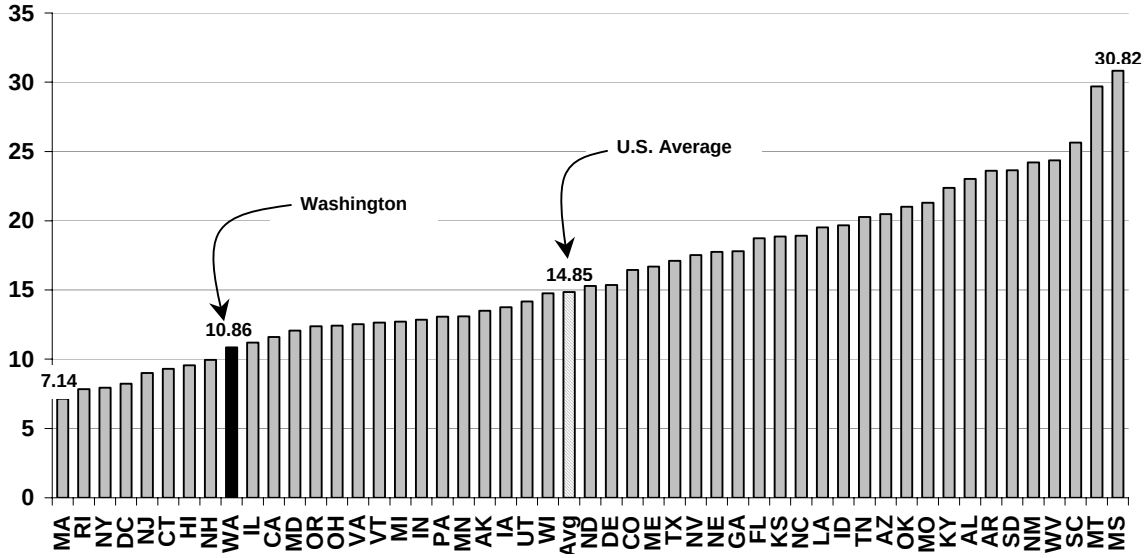
Percent Decline in Rate of Fatalities Per 100 Million VMT Compared to Percent Decline in Rate of Fatalities Per Capita
1980 - 2002: 1980 = 1.00



Motor Vehicle Fatality Rates in Washington Compared to the National Average
Fatalities Per 100 Million VMT: 1980 - 2002



Rate of Fatalities Per Capita in the U.S.
Traffic Fatality per 100,000 Population in 2002



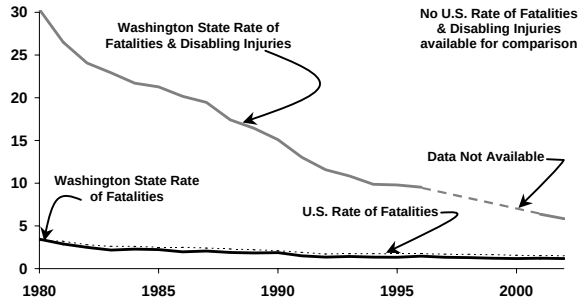
Source: USDOT National Highway Traffic Safety Administration "Traffic Safety Facts: 2002"

Adding disabling injury collisions to fatal collisions

When disabling injury collisions are paired with fatal collisions, the picture expands to include all of the most serious accidents.

The incidence of these serious collisions has declined in recent years. While in 2002 there were 658 fatalities, the total number of fatal and disabling injury accidents in the same year was 3,199. In 1980, the respective totals were 860 fatality accidents and 8,703 total fatal and disabling injury accidents. Because of the steep growth of the VMT denominator, the "Fatal and Disabling Injury" rate per 100 million VMT has fallen over the years. The relative decline is sharper than the decline in fatality rates per 100 million VMT over the same period.

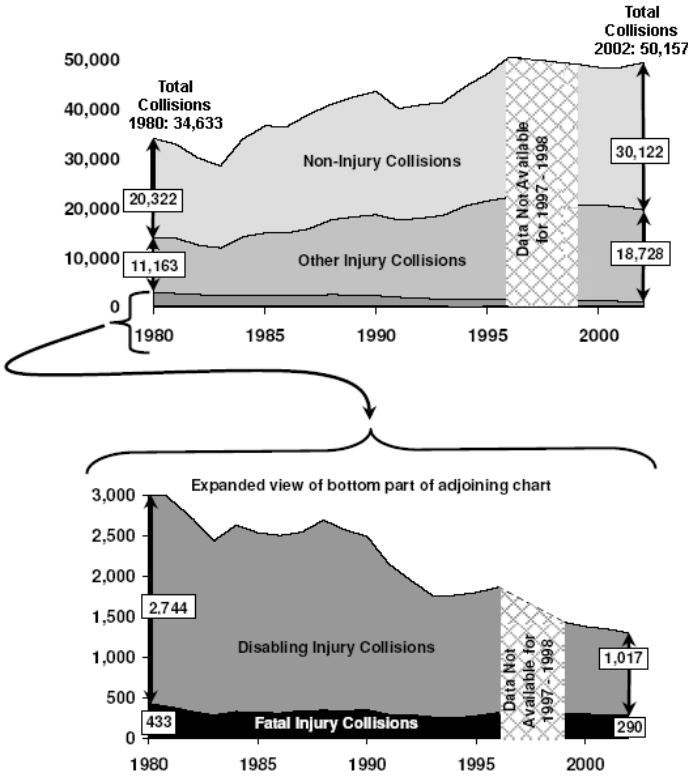
Motor Vehicle Fatality Plus Disabling Injury Rates in Washington
Per 100 Million VMT: 1980 - 2002



Meanwhile, the total number of collisions – all types – has gone up and up

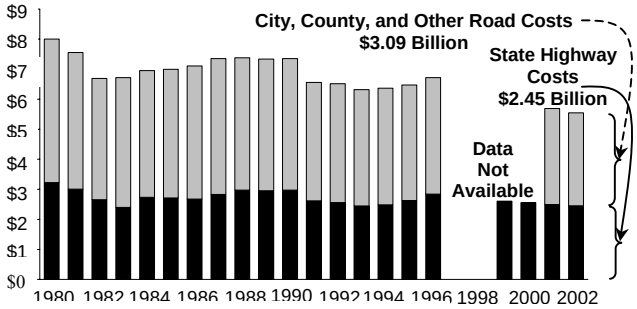
Fatal collisions are only a small fraction of all accidents on the roadways. For the state highway system, WSDOT's data shows that the sum of *all collisions* grew from 34,662 in 1980 to 50,157 in 2002. This is an overall increase of 45%. However, VMT over the same period increased by 88%. So despite the fact that the volume of collisions grew, that growth was relatively not as great as the growth of VMT.

Statewide data for *all roadways* in Washington shows a reported 127,869 collisions in 2002. The data for city streets, county roads, tribal roads, and others are still being reviewed to determine the accurate breakdown of the types of collisions. Because of these data limitations, the chart on the previous page shows the distribution of collision types drawn only from state highways, where 50,157 (39%) of the 127,869 total reported collisions occurred.



Societal Costs of Motor Vehicle Collisions in Washington State 1980 – 2002

Cost in 2002 Dollars (in Billions)



Source: WSDOT Transportation Data Office

Societal costs of motor vehicle collisions

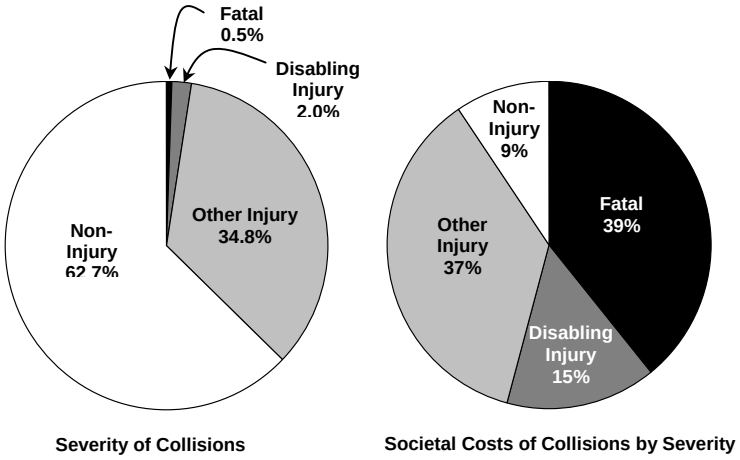
Applying methodologies suggested for use by the Federal Highway Administration to the data of accidents on Washington state highways, WSDOT roughly estimates the *societal cost* of accidents. The societal cost calculation for accidents on state highways (39% of the total state-wide reported accident count) in 2002 is $2.45 billion. Extrapolating to the overall estimated total of accidents of all highways and roadways, the *total annual*

societal cost of motor vehicle accidents for Washington can be estimated at approximately $5.6 billion. That is about $930 for every man, woman, and child in the state. This amount includes medical costs, lost wages, property damage, lost productivity, and so forth.

As shown in the graph above, the calculated societal cost of motor vehicle accidents has dropped somewhat in real dollar terms over the last twenty years. Because fatal accidents are assigned much higher costs in the calculation formula than any other type of accident, the reduction in fatal accidents has offset the impact of the ever-growing number of non-fatal accidents.

The pie charts on the right compare the severity of collisions in Washington State in 2002 and the cost of those collisions. The high cost of fatal and disabling injury collisions is demonstrated by the fact that only 2.5% of the collisions involve fatalities and disabling injuries, yet these accidents account for 54% of the total societal cost of collisions.

Severity of Collisions and
Societal Costs of Collisions by Severity
All Washington Roads - 2002



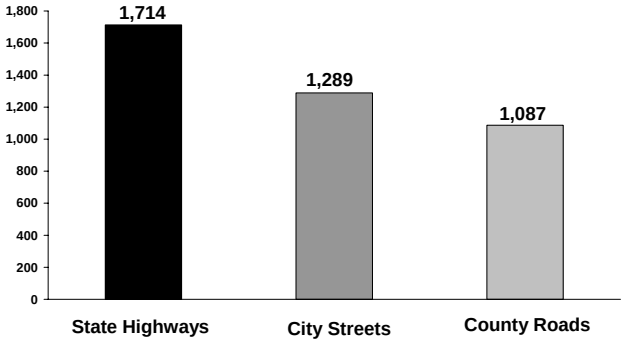
Source: WSDOT Transportation Data Office

Where do the collisions occur?

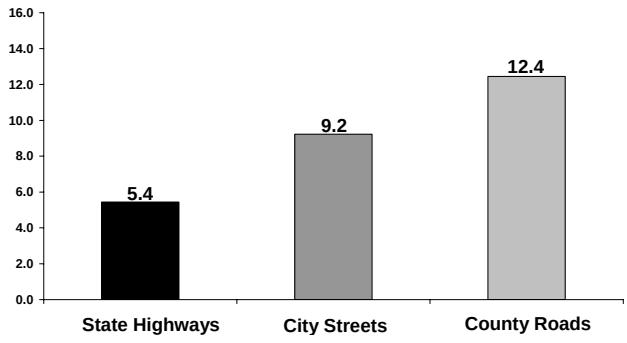
The most severe accidents are broadly spread across the state on state highways, city streets and county roads. The data can be viewed either by tallying these serious accidents associated with the roadway type or by computing a rate by roadway type for these accidents per 100 million VMT.

The data below compares the number and rate of serious accidents by roadway type. In sum, a greater *number* of collisions occur on state highways than on city streets, and more collisions occur on city streets than on county roads. When the volume of traffic is taken into account, the *rate* of collisions is lower on state highways than on city streets (state highways have much higher VMT), and lower on city streets than on county roads (city streets have much higher VMT).

Number of Motor Vehicle Fatalities and Disabling Injury Collisions By Roadway Type in Washington State*
2002



Rate of Motor Vehicle Fatalities and Disabling Injury Collisions By Roadway Type in Washington State*
Per 100 Million VMT: 2002

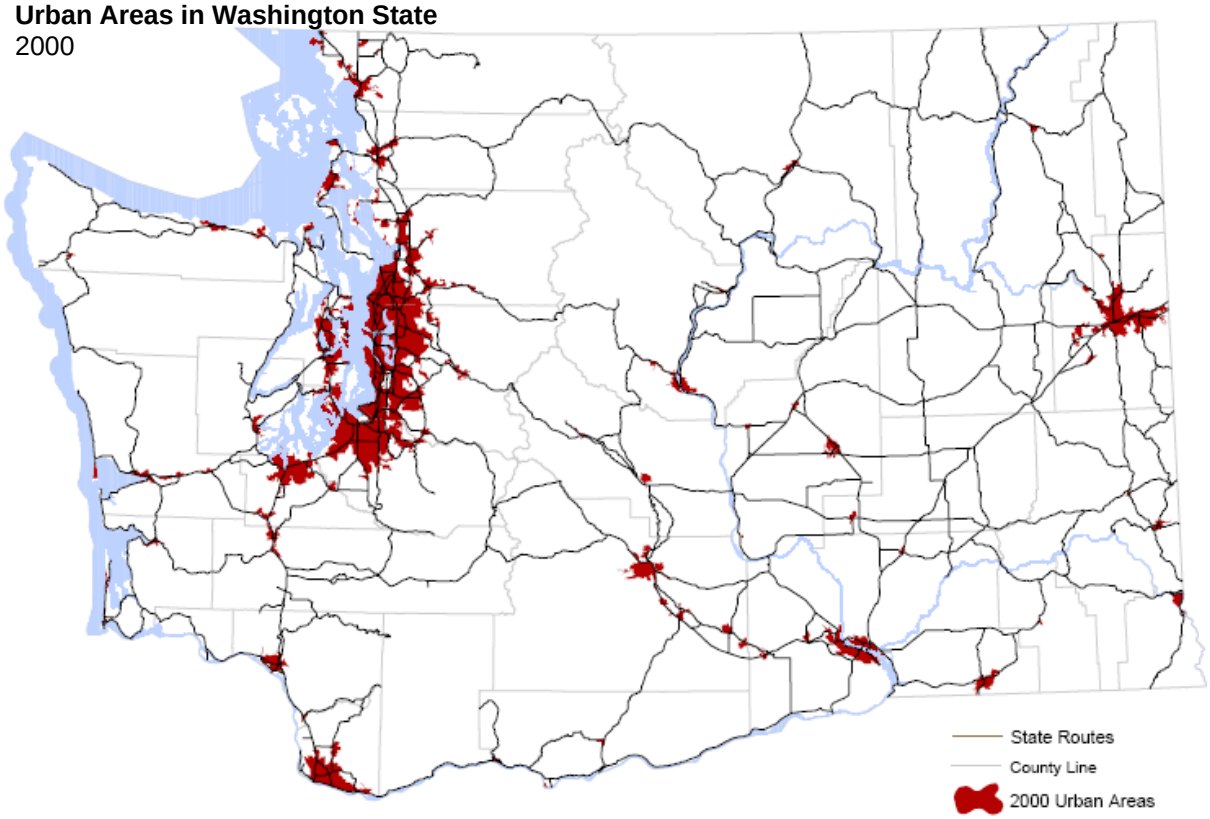


Source: WSDOT Transportation Data Office

*Fatal and disabling injuries on other roads (tribal, parks, forest service, etc.) have also been reviewed. Typically, only about 2% of the serious accidents occur on these roads. The rate per 100 million VMT on these other roads fluctuates greatly, depending on the number of injuries in a given year. For example, it was 7.0 in 2001 and 13.7 in 2002.

Another way of finding location specific data on fatal and disabling accidents is to compare urban roadways to rural roadways (regardless of the level of government that owns the road). Roadways are classified as either urban or rural based on a federal designation of "urban areas," which are established by the population density of an area. "Urban Areas" are highlighted in the map below.

Urban Areas in Washington State
2000



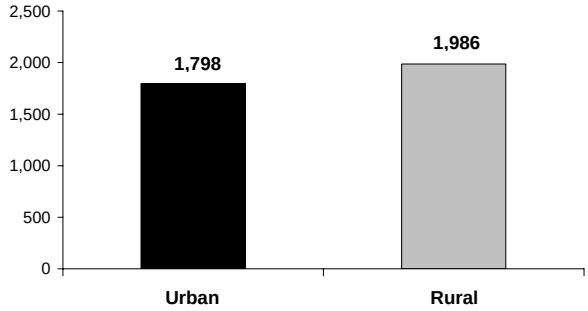
Source: WSDOT Strategic Planning & Programming Office

The charts on the following page show that the number of collisions is almost evenly divided between urban and rural areas. The rate of such collisions (per 100 million VMT) is much higher in rural areas because VMT levels are so low in the rural areas.

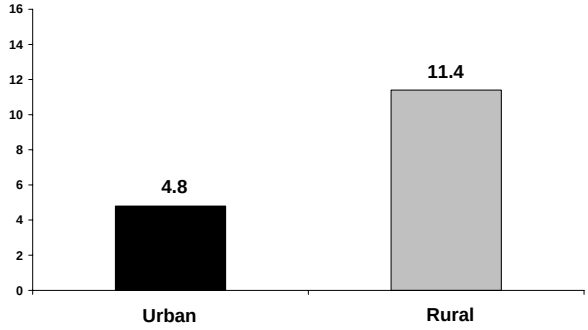
The high rate of fatal and disabling injury collisions per VMT on rural roads compared to urban roads has attracted special attention to the problem of single-car run-off-the-road accidents on rural two-lane roads. The charts on the right are based on data that includes interstates and other four-lane or divided highways in the "rural" component. Removing the rural interstates from this picture actually shows that the problem of serious collisions on the remaining rural roadways is even higher than the graph at first glance would suggest.

On those roads an overall rate of fatalities and disabling injuries of 14.6 per 100 million VMT can be calculated for 2002. The rural interstates and expressways are far safer than the remaining inventory of rural roads, with a rate of fatalities and disabling injuries of 2.98 per 100 million per VMT.

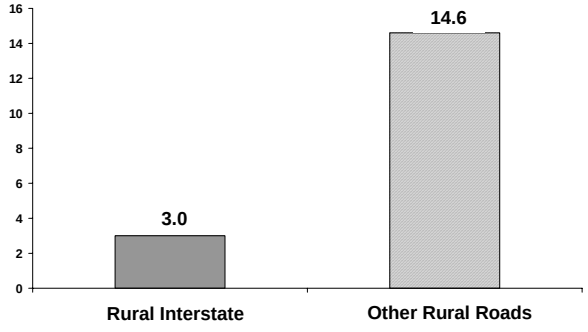
Number of Fatalities and Disabling Injury Collisions By Urban and Rural Roadways
2002



Rate of Fatalities and Disabling Injury Collisions By Urban and Rural Roadways
Rate Per 100 Million VMT
2002



Rate of Fatalities and Disabling Injury Collisions By Rural Interstates and Other Rural Roads
Rate Per 100 Million VMT
2002



Source of above charts: WSDOT Transportation Data Office

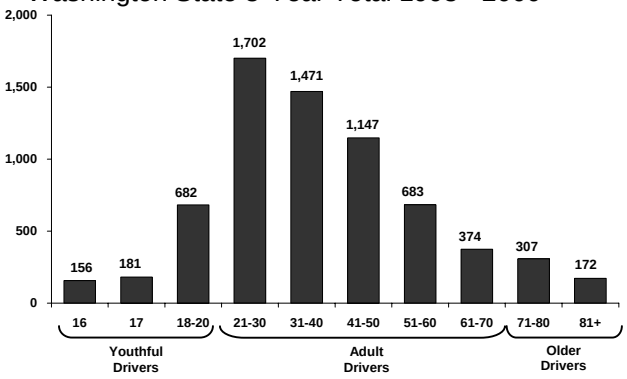
What Factors Contribute to Motor Vehicle Collisions?

Accident data exist to compare different types of roads and areas of the state in relation to the aggregate of "fatal" and "disabling injury" accidents. However, information is available only for accidents in the "fatal" class to examine the relationships between accidents and the behavior and characteristics of the drivers involved.

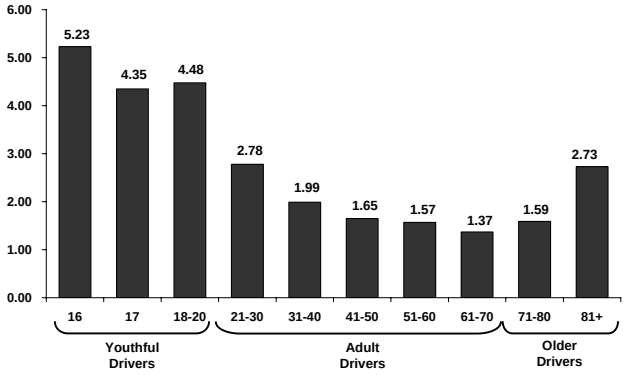
Age of drivers

The involvement of drivers in fatal collisions from various age groups is shown in the graphs below:

Number of Drivers Involved in Fatal Collisions by Age Group
Washington State 8-Year Total 1993 - 2000

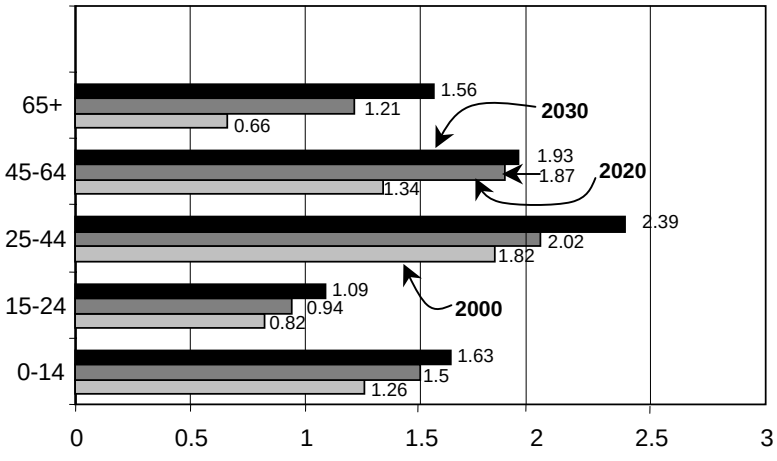


Rate of Fatal Collisions by Driver Age Group
Washington State 8-Year Average 1993 – 2000
Per 10,000 Licensed Drivers



Source: WSDOT Transportation Data Office

Population Shown by Age Group
Population in Millions



Source: WSDOT Transportation Data Office

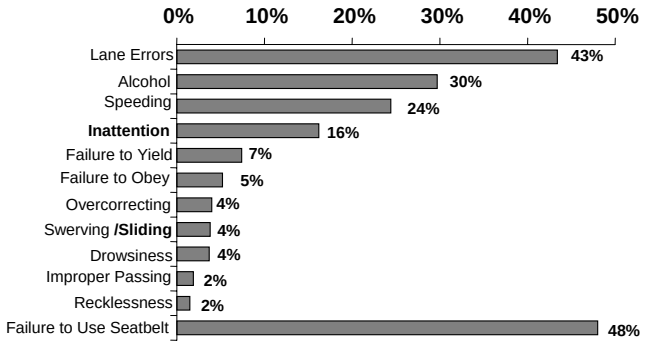
For the youngest drivers, inexperience and/or immaturity makes driving very hazardous. Indeed, in the 15- to 20- year old age bracket, motor vehicle accidents are the leading cause of death in Washington State. At the other end of the age spectrum, collision risk also grows. This suggests that drivers tend to lose driving capabilities in their senior years. This problem is widely discussed in Washington State and across the country because longer average life spans mean that an ever-larger proportion of people on the road are likely to be older drivers. In Washington, as the chart to the right shows, every age group will

grow but the greatest proportional growth will be in the over-65 age bracket. In 2000, individuals over 65 years old accounted for 11% of the population; in 2020 they will make up 16%.

Driver errors and behaviors

The table at right shows the association between fatal collisions and various driver behaviors, errors, and characteristics. Each bar indicates the percentage of fatal accidents in which the particular characteristic was identified. A single accident might be represented in more than one category. For example, a "lane error" accident might also be the result of alcohol impairment and the failure to yield. Therefore, the sum of the bars adds up to well over 100%.

Driver Errors and Behaviors Associated With Fatal Collisions in Washington State*
1993 - 2001



Source: WSDOT Transportation Data Office

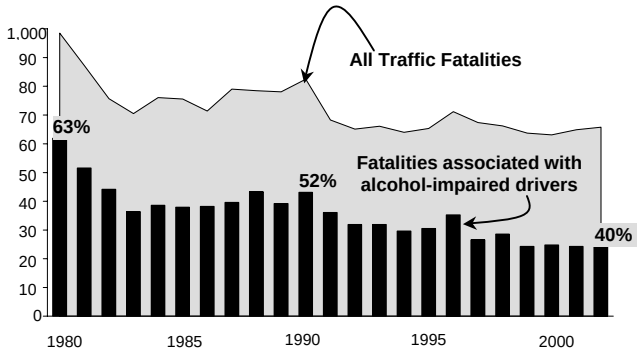
*Failure to use seat belt percentage is extrapolated from accident information for 2002 only. As seat belt use has increased since 1993, fatalities have been prevented in what previously would have been fatal accidents and, as a result, the tally of fatal accidents in which seat belts were not used has gone higher and higher.

As the table above shows, bad driving (e.g., lane errors, failure to yield, improper passing, etc.) plays a role in a very large number of motor vehicle fatalities. Bad driving—whether or not it occurs in combination with drunk driving, drowsiness, etc.—is a very significant safety issue.

Alcohol impairment

Fatal motor vehicle accidents show a very high correlation with driver impairment by alcohol or other drugs. The chart to the right shows that in 1980, more than 60% of approximately 1,000 fatalities involved driver alcohol impairment. The ratio has declined somewhat in the intervening years. In 2001 the ratio was 37%. Steady progress, however, is elusive: In 2002 the rate climbed back up to 40%.

Trend in Rate of Driver Alcohol Impairment Associated with Motor Vehicle Fatalities in Washington State
1980 - 2002

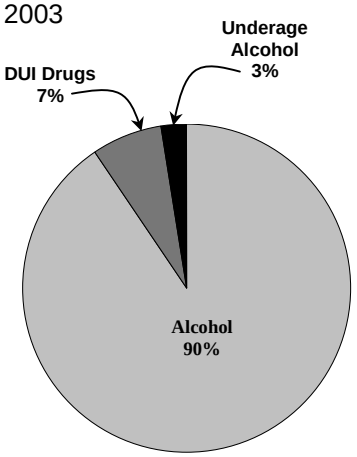


Source: Washington State Traffic Safety Commission

While "Driving Under the Influence (DUI)" arrests include drug as well as alcohol impairment, data on the Washington State Patrol arrests in 2003 shows that alcohol is still the overwhelming type of impairment of drivers.

Washington's experience with driver alcohol impairment in fatal collisions is on the negative side of the national average. The ranking prepared by the U.S. Department of Transportation for 2001, when 37% of the fatalities in Washington involved alcohol, showed Washington State in 30th place among the 50 states. In 2002, with 40% of the fatalities involving alcohol, Washington's rank will probably be even worse.

DUI Arrests by Washington State Patrol
2003



Source: Washington State Patrol

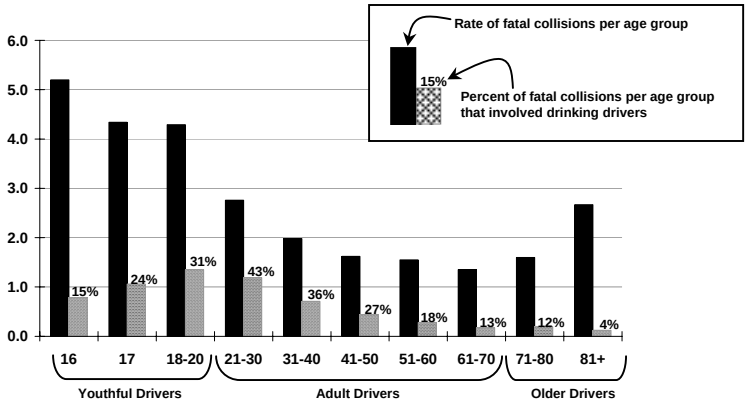
Motor Vehicle Fatalities Involving High Blood Alcohol Concentration
(BAC >= 0.08 grams per deciliter): 2001

Rank	State	Percent
1	Utah	19
2	Arkansas	25
3	Kentucky	25
4	New York	26
5	Iowa	28
6	Georgia	29
7	North Carolina	30
8	Indiana	31
9	Virginia	31
10	Maine	31
11	California	32
12	Mississippi	32
13	Oregon	32
14	Nebraska	32
15	West Virginia	32
16	Michigan	33
17	New Jersey	33
18	Idaho	33
19	Alabama	34
20	Kansas	34
21	Minnesota	34
22	Oklahoma	34
23	Vermont	35
	US Average	35
24	Hawaii	36
25	Florida	36
26	Maryland	36
27	Nevada	36
28	Ohio	37
29	Tennessee	37
30	**Washington**	**37**
31	Wyoming	38
32	Colorado	38
33	Pennsylvania	38
34	Illinois	38
35	New Hampshire	39
36	New Mexico	39
37	Arizona	40
38	Louisiana	40
39	Missouri	40
40	Delaware	42
41	Montana	42
42	North Dakota	42
43	Massachusetts	43
44	Texas	43
45	Wisconsin	43
46	South Dakota	44
47	Connecticut	45
48	Alaska	46
49	Rhode Island	49
50	South Carolina	49

Source: US Department of Transportation

Alcohol is especially likely to be involved in motor vehicle fatalities when the driver is in the 18- to 40-year old age group. Compare the record for 16-year old drivers—inexperienced drivers, high fatality rate, but a relatively low (if still unacceptable) 15% rate of alcohol involvement, with the record for 21- to 30-year old drivers—experienced drivers, much lower fatality rate, but an almost unbelievable 43% rate of alcohol involvement in those collisions! In the 18- to 20-year old age group, the rate of alcohol involvement is 31% and in the 31- to 40-year age group the rate is 36%.

Fatal Collision Rates By Driver Age Group
Fatal Collision Rate Per 10,000 Licensed Drivers
Percent of Fatal Collisions with Drinking Drivers*
(8-Year Average 1993 – 2000)



*Drinking Driver in the graph above refers to a driver involved in a fatal collision who registers a positive Blood Alcoholic Concentration. (BAC > 0).

Speeding

Speeding contributes significantly to fatal motor vehicle accidents. As previously noted, collisions can be caused by more than one type of driver error. Nationwide, speeding, defined as speed too fast for conditions or in excess of the posted limit, is a factor in one-third of all motor vehicle fatalities. Excessive speed can contribute to both the frequency and severity of motor vehicle collisions. Extra time is required to stop a vehicle and extra distance is traveled before corrective maneuvers can be implemented. Speeding reduces a driver's ability to react to emergencies, such as situations created by driver inattention, unsafe maneuvers of other vehicles, roadway hazards, vehicle system failures or hazardous weather conditions. A vehicle that was exceeding the speed limit at the time of an accident does not necessarily mean that speeding was the cause of the collision, but the probability of avoiding the collision would likely be greater had the driver or drivers been traveling at slower speeds.

Local and collector roads have a speeding fatality rate almost triple that of the interstates. Rural roads are especially hazardous for speeders and those who share the road with them. Almost 65% of all speeding-related fatalities take place on rural roads. Rural local roads are especially problematic locations; the speeding-related fatality rate is four times higher on these roads than on urban local roads.

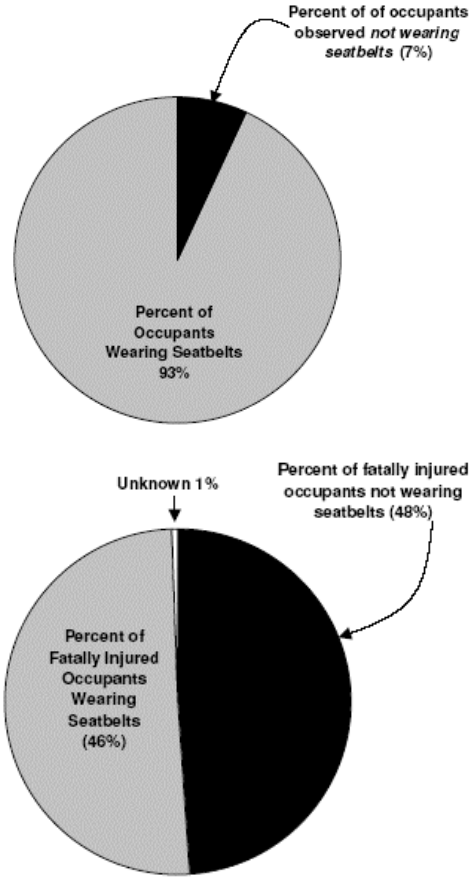
Inattentive and sleepy drivers

Driver inattention and drowsiness are also significant contributors to fatal collisions in Washington State. Statewide data shows that inattention contributed to 16% of all fatal collisions from 1993-2001. Fatalities associated with sleepy drivers contributed another 4% during the same time period. Although a breakdown of specific types of inattention

is not available for the collision records, individual collisions record inattentive behavior such as changing the radio station, talking on a cell phone, getting something out of the back seat, eating, grooming, reading or dozing.

Not using seat belts

Analysis of motor vehicle fatalities for 2002, a year when seat belt use in Washington was about 93% (the highest in the nation), shows that about *half the persons who died as drivers or passengers were not wearing seat belts.*



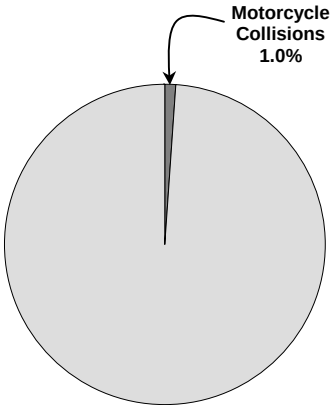
Other factors

Motorcyclists

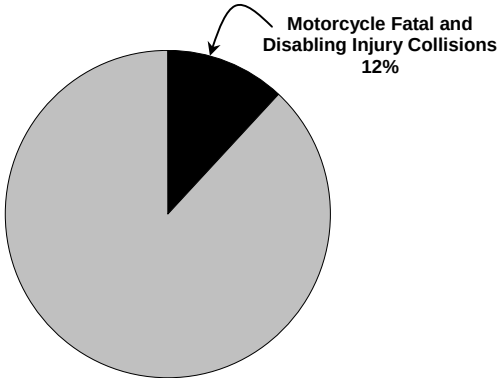
While the rate of all collisions that involve motorcycles in Washington is only 1.4%, the percent of fatal and disabling collisions that involve motorcycles is a disproportionate 12%. In 2002, there were 385 fatal and disabling injury collisions involving motorcycles.

Data for motorcycle VMT are not available, so a direct comparison of fatal and disability injury collision rates per 100 million VMT between motorcyclists and other drivers cannot be determined at this time. From 1980 through 1994, motorcycle registrations in Washington State declined from approximately 136,000 to around 97,000. Since the year 2000, there has been an increase in motorcycle registrations. The total motorcycle registration for 2002 was approximately 128,000. The graph below compares the percent change in motorcycle ownership to the percent change in motorcycle fatalities over the past 23 years.

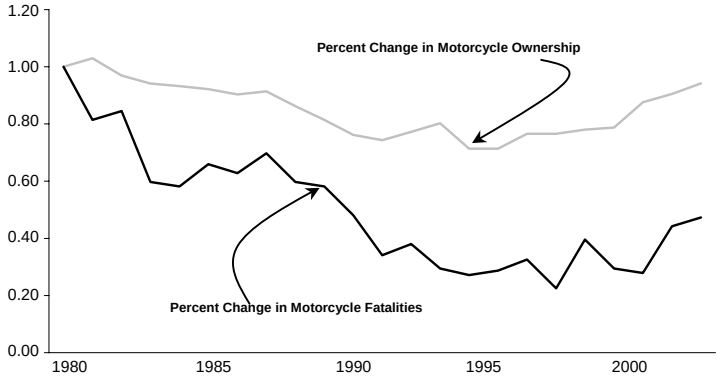
Percent of All Collisions Involving Motorcycles
2002



Percent of All Fatal and Disabling Injury Collisions Involving Motorcycles
2002



Percent Change in Motorcycle Ownership Compared to Percent Change in Motorcycle Fatalities
All Washington State Roads 1980 – 2002
1980 = 1.0



Source of above charts: WSDOT Transportation Data Office

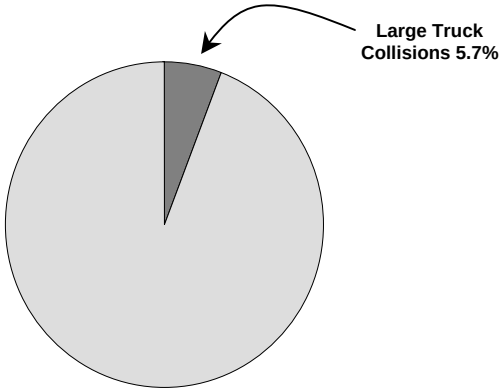
Large trucks

In 2002, large trucks were involved in 5.7% of all collisions in Washington State. Of the fatal and disabling injury collisions, 6.8% (219 out of 3,199) involved large trucks. This data indicates that the severity of collisions involving large trucks is only slightly disproportionate to the overall frequency of collisions involving large trucks.

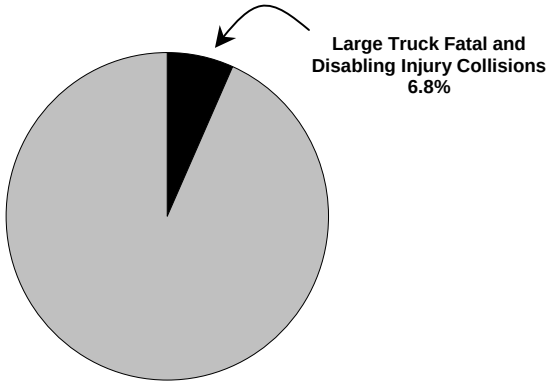
The best data available to WSDOT (collected by a sampling process at over 900 locations statewide) suggests that approximately 9.1% of total vehicle miles traveled (VMT) is by large trucks (trucks over 1000ℓ gross weight). Based on this information, the rate (per 100 million VMT) for both *all collisions* and *fatality and disabling injury collisions* is lower for all trucks than it is for all vehicles together.

Incident reports prepared by the Washington State Patrol show that trucks involved in non-fatal collisions exceed safe speeds 37% of the time, fail to yield 23% of the time, or follow too closely 11% of the time. Other contributing factors include defective equipment and driver inattention.

Percent of All Collisions Involving Large Trucks
2002

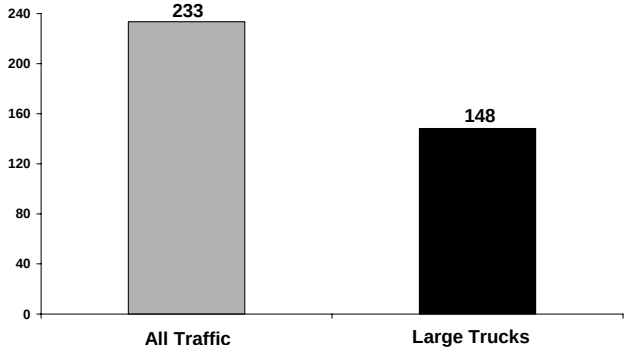


Percent of All Fatal and Disabling Injury Collisions Involving Large Trucks
2002

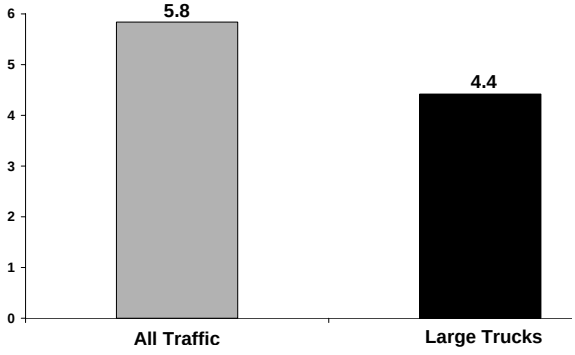


Source of above charts: WSDOT Transportation Data Office

Rate of All Collisions per 100 Million VMT
2002



Rate of Fatal and Disabling Injury Collisions Per 100 Million VMT
2002

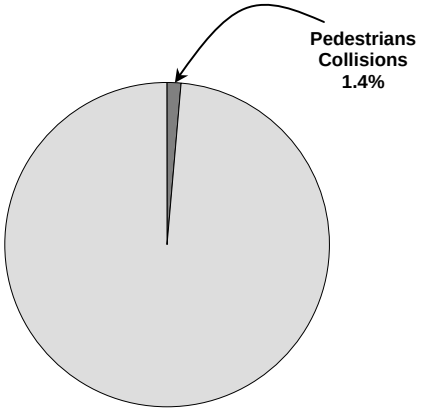


Source: WSDOT Transportation Data Office

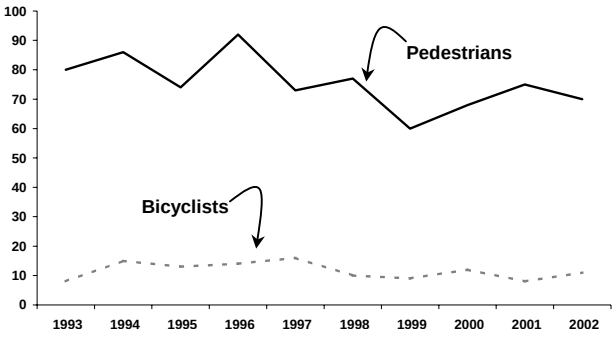
Pedestrians

Pedestrian fatalities, as the result of motor vehicle collisions, have declined slightly since 1993. Nevertheless, in 2002 the death tally was greater than the number of motorcycle fatalities and accounted for more than 11% (70 out of 658) of the total motor vehicle fatality count. In 2002, 1.4% (1,744 out of 127,869) of all roadway collisions involved pedestrians, yet 11% (353 out of 3,199) of the fatalities and disabling injuries accounted for pedestrians injured or killed in motor vehicle collisions. This illustrates the likelihood of a pedestrian involved in a motor vehicle accident to either incur severe injury or death.

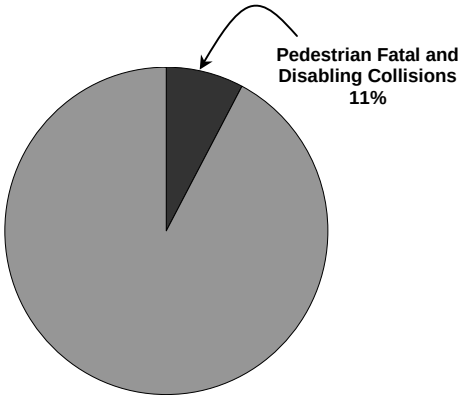
Percent of All Collisions Involving Pedestrians
2002



Number of Fatalities for Pedestrians in Washington State 1993 - 2002



Percent of All Fatal and Disabling Collisions Involving Pedestrians
2002



Source of above charts: WSDOT Transportation Data Office

In 2001, the National Highway Traffic Safety Administration ranked Washington State 33rd out of 50 states based on the number of pedestrian fatalities per 100,000 in population. In 2002, Washington's rate was 1.14 fatalities per 100,000 in population, which should improve the ranking.

The following excerpt, taken from the December 2002 *Gray Notebook*, provides information about specifics of pedestrian fatalities in Washington.

Reducing Pedestrian Fatalities

A key to roadway safety is protecting pedestrians. Washington's pedestrian fatality rate was 18th lowest nationally in 2001. A total of 74 pedestrian fatalities occurred on all roadways statewide with 28 fatalities on state highways. Accident trends in the frequency of pedestrian fatalities per 100,000 people have declined over the past six years.

Of the 175 pedestrian deaths on state highways from 1996 to 2001, alcohol intoxication* was involved in roughly a third of the fatalities.

- In **57** fatalities, the pedestrian was drunk;
- In **3** fatalities, the driver was drunk.

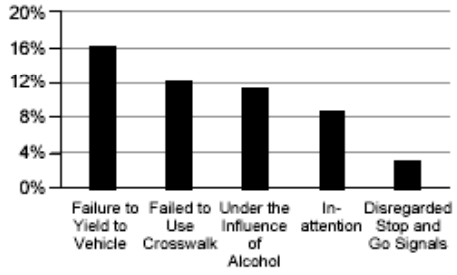
**Blood Alcohol Concentration (BAC) more than .10*

The majority of the pedestrian deaths with alcohol involvement occurred in the greater Seattle area and, of those, many occurred on State Route 99. This corridor is also a major transit route. Research by the Washington State Transportation Center has shown that 80% of high pedestrian accident locations occur within 100 feet of a transit stop. Issues on SR 99 include roadway width, inadequate illumination, high volumes of traffic, and inadequate pedestrian facilities.

Evaluation of all pedestrian collisions, including injuries and disabling injuries, is necessary to understand pedestrian safety problems. The chart below shows the most frequent contributing factors for pedestrians in vehicle/pedestrian collisions. Contributing circumstances for drivers are not shown. Many collisions have no identified violation contributing to the accident. In these cases, further evaluation of environmental and other circumstances is needed.

Most Frequent Pedestrian Factors in Vehicle/Pedestrian Collisions on State Highways

Percent of Pedestrian Accidents, 1996-2001



Future editions of the Gray Notebook *will further examine pedestrian safety on state highways.*
Source: WSDOT Transportation Data Office.

2001 Pedestrian Fatality Rates by State

Fatalities per 100,000 Population

Fatality Rank	*State*	*Killed*	*Pedestrians Rate*
1	North Dakota	3	0.47
2	Iowa	19	0.65
3	Nebraska	12	0.70
4	New Hampshire	9	0.71
5	Vermont	5	0.82
6	Wisconsin	45	0.83
7	Minnesota	43	0.86
8	Ohio	99	0.87
9	Kansas	24	0.89
10	Idaho	12	0.91
11	Indiana	56	0.92
12	Maine	12	0.93
13	Rhode Island	10	0.94
14	Alaska	6	0.95
15	Connecticut	33	0.96
16	Montana	9	1.00
17	Wyoming	5	1.01
18	Washington	73*	1.22
19	Massachusetts	79	1.24
20	Kentucky	53	1.30
21	Tennessee	78	1.36
22	Colorado	61	1.38
23	Virginia	101	1.41
24	Oklahoma	50	1.45
25	Utah	33	1.45
26	Missouri	83	1.47
27	Illinois	186	1.49
28	Arkansas	41	1.52
29	Alabama	68	1.52
30	Pennsylvania	188	1.53
31	West Virginia	28	1.55
32	New Jersey	132	1.56
33	Michigan	162	1.62
34	Oregon	58	1.67
	U.S. Average		**1.71**
35	Georgia	146	1.74
36	North Carolina	149	1.82
37	New York	347	1.83
38	Maryland	101	1.88
39	South Dakota	15	1.98
40	California	711	2.06
41	Mississippi	59	2.06
42	Texas	449	2.11
43	Delaware	17	2.14
44	Nevada	45	2.14
45	Louisiana	98	2.19
46	Hawaii	30	2.45
47	South Carolina	108	2.66
48	Florida	489	2.98
49	Arizona	159	3.00
50	New Mexico	72	3.94

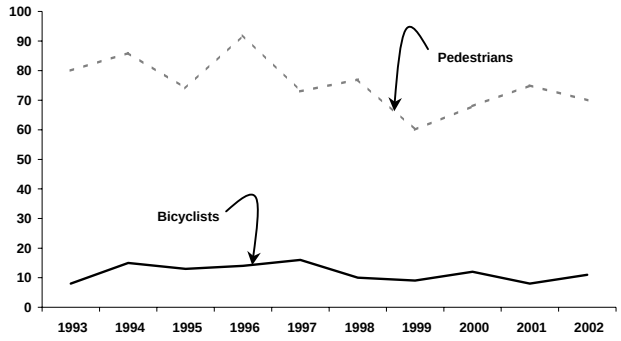
** This total does not include one pedestrian fatality reported in the state's collision reporting system.*

Source: National Highway Traffic Safety Administration.

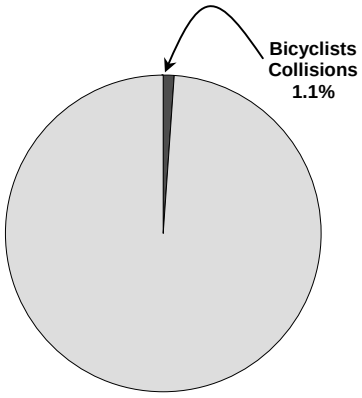
Bicyclists

For bicyclists involved in motor vehicle collisions, the death tally has held relatively steady for a decade in the range of ten to twenty deaths per year. Taking the 2002 data, bicyclists were involved in 1,391 collisions out of a total of 127,869 statewide, or 1.1%. In looking at serious injury and fatal collisions, bicyclists were involved in 124 of the fatal and disabling injury accidents out of the 3,199 serious collisions statewide (3.9%). The rate of bicyclist death or disabling injury at 3.9% of all fatal and disabling injury collisions is disproportionate, though not by as much as for the pedestrians.

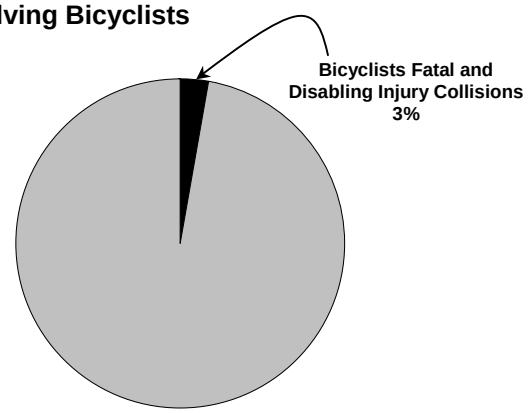
Number of Fatalities for Bicyclists
Washington State 1993 - 2002



Percent of All Collisions Involving Bicyclists
2002



Percent of All Fatal and Disabling Collisions Involving Bicyclists
2002



Source of above charts: WSDOT Transportation Data Office

In 2001, Washington ranked in 16th place among the states by bicyclist fatalities. The excerpt below provides more on bicycle safety.

Reducing Bicyclist Fatalities

Washington ranked 16th lowest in bicyclist fatality rates in 2001, compared to other states. Eight bicyclists were killed on Washington state highways in 2001. In addition, there were more than 200 reported accidents involving bicyclists, including disabling injury accidents. This may be the tip of the iceberg: a recent FHWA study of hospital emergency department data indicates that between 40 and 60 percent of all bicycle accidents are not captured in highway reporting data.

Consistent with accident trends for pedestrians (see the *Gray Notebook* for the quarter ending December 31, 2002), State Route 99 appears to be the corridor with the largest concentration of bicycle-related accidents from 1995 to 2001. Some of the risk factors at work on SR 99 include vehicle traffic volumes, vehicle speeds, shoulder configurations and illumination conditions.

Traffic Safety Near Schools

In 1999, WSDOT began administering a grant program called Traffic Safety Near Schools. This program has now funded more than 70 projects statewide designed to improve bicyclist and pedestrian safety near schools. However, the program has not been able to fund nearly 90 additional project proposals. The legislature's new transportation budget provides an additional $1.5 million to fund 10 to 12 more projects, leaving about 80 unfunded.

Some of these grants have already had significant impacts on safety. For example, the 155th Street crossing in Kenmore was defined as a high accident area. Since receiving the Traffic Safety Near Schools grant in 2000 to improve sidewalk and pedestrian safety, Kenmore has not had an accident at this location.

Federal Benchmarking Progress

The Federal Highway Administration (FHWA) recently completed a benchmarking study of all states and their bicycle and pedestrian programs. Washington met all pedestrian benchmarking standards and all but one bicycle benchmark, ranking Washington second nationally.

Scoring on Eight Performance Benchmarks

- ☑ Bike/Ped Plan exists
- ☐ Bicycle Plan meets FHWA guidance
- ☑ Accomodates bicycles in highway projects
- ☑ Includes sidewalk in new urban highway projects
- ☑ Includes sidewalks in re-construction projects
- ☑ Sidewalks are generally included in urban projects
- ☑ Statewide Safe Routes Program
- ☑ Other Statewide programs

2001 Bicyclist Fatality Rates by State

Fatalities per 100,000 Population
Source: National Highway Traffic Safety Administration

Ranked lowest fatality rate to highest

Rank	State	Bicyclists Killed	Fatality Rate
1	North Dakota	0	0.00
2	Vermont	0	0.00
3	Arkansas	1	0.04
4	Oklahoma	2	0.06
5	Connecticut	2	0.06
6	Kansas	2	0.07
7	New Hampshire	1	0.08
8	Tennessee	5	0.09
9	Rhode Island	1	0.09
10	Iowa	3	0.10
11	Missouri	6	0.11
12	Montana	1	0.11
13	Pennsylvania	14	0.11
14	Utah	3	0.13
15	South Dakota	1	0.13
16	**Washington**	**8**	**0.13**
17	Alabama	6	0.13
18	Minnesota	7	0.14
19	Ohio	16	0.14
20	Massachusetts	9	0.14
21	Idaho	2	0.15
22	Alaska	1	0.16
23	Wisconsin	9	0.17
24	West Virginia	3	0.17
25	Virginia	13	0.18
26	Nevada	4	0.19
27	Indiana	12	0.20
28	Kentucky	8	0.20
29	Wyoming	1	0.20
30	Maryland	11	0.20
31	New York	41	0.21
32	Texas	46	0.22
33	Illinois	27	0.22
34	Georgia	20	0.24
35	Michigan	24	0.24
36	Colorado	11	0.25
37	Delaware	2	0.25
	U.S. Average		**0.26**
38	Mississippi	8	0.28
39	Nebraska	5	0.29
40	North Carolina	24	0.29
41	California	105	0.30
42	New Jersey	26	0.31
43	Maine	4	0.31
44	New Mexico	7	0.38
45	Oregon	15	0.43
46	Louisiana	23	0.51
47	Arizona	28	0.53
48	Hawaii	7	0.57
49	South Carolina	24	0.59
50	Florida	127	0.78

Road features and conditions

Many of the most serious motor vehicle accidents (fatalities and disabling injuries) are associated with roadway features and conditions. Some of the commonly tracked categories include:

Left the roadway
Vehicles may collide with a fixed object (perhaps a utility pole or tree). This may result in vehicle overturn (perhaps an issue of roadway geometry or unprotected adjacent embankments and so forth).

Hit at angle
Vehicle collides with another vehicle while entering the roadway at an angle (perhaps an issue of ramp or intersection configuration or of uncontrolled access from a driveway or parking lot).

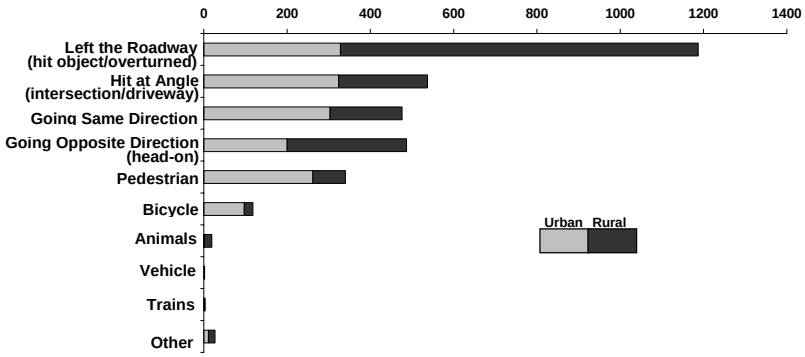
Going same direction
This is a rear-end collision (perhaps an issue of sight distance, inadequate channelization for turning, or related issue).

Going opposite direction
This causes a head-on collision (crossing the centerline).

These categories can apply to many different situations and not all accidents tallied in each category could be said to be associated with inadequacies of the roadway. Nevertheless, the overall scale of such circumstances in the total picture of fatal and disabling accidents, as well as the significance of the categories in relation to each other, is important.

The most common causes for vehicle collisions appear to vary by location of the accident. "Leaving the roadway" and "head-on collision" accidents are more likely to happen in rural areas than in urban areas. The opposite is true for "hit at angle" or "rear-end" collisions. Accidents involving pedestrians and bicyclists are also more likely in urban areas.

Roadway Circumstances and Conditions Associated with Fatal and Disabling Injury Collisions in Washington State
2002



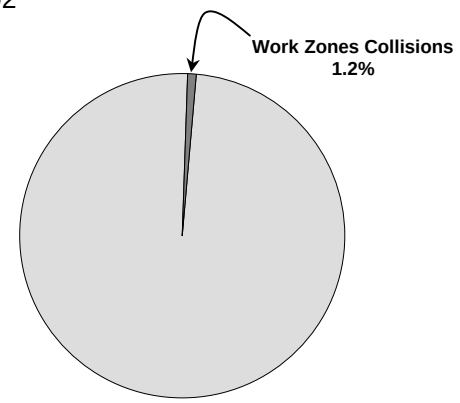
Source: WSDOT Transportation Data Office

Collisions in work zones

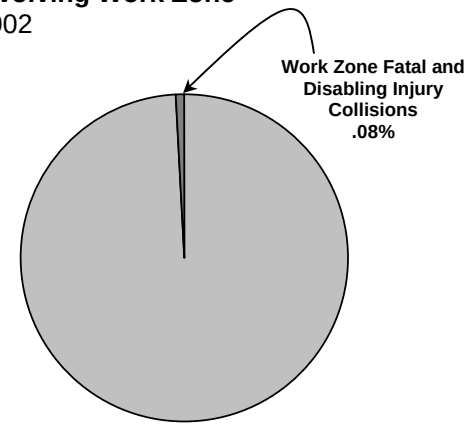
Less than 1% of all fatal and disabling injury collisions are linked to work zone areas. More motorists than highway workers are killed and injured in work zones. In 2002, seven fatalities occurred in areas around or in work zones and out of the seven, five were travelers and two were highway workers.

Most work zone collisions occur in daylight hours. Over 90% of work zone collisions are motorists hitting each other, a fixed object, or even overturning their vehicles in a work zone. The leading types of collision include rear-end and fixed object collisions.

Percent of All Collisions Involving Work Zone
2002



Percent of All Fatal and Disabling Collisions Involving Work Zone
2002



Source of above charts: WSDOT Transportation Data Office

The "Golden Hour"

Swift medical response to trauma of any kind is critical to survival. Motorists in the worst car collisions often die immediately or within minutes of impact. But trauma care saves many lives when it arrives quickly. The key is to get victims treatment within the "Golden Hour" immediately following the accident.

The response times described in the chart called "Trauma Response Times" are taken from analysis of a sample of 44% of all motor vehicle-related trauma responses in Washington State for the period of January 1, 2003 through December 31, 2003.

Trauma Unit Response Times
2003

	Urban*	Suburban**	Rural***
Less than 5 min.	31%	27%	9%
5 to 10 min.	48%	45%	36%
11 to 20 min.	14%	20%	38%
More than 20 min.	7%	8%	17%
Average	7.6 min.	9.3 min.	13.8 min.
Target	8 min.	15 min.	45 min.

Source: Washington State Department of Health, Office of Emergency Medical Services and Trauma Systems

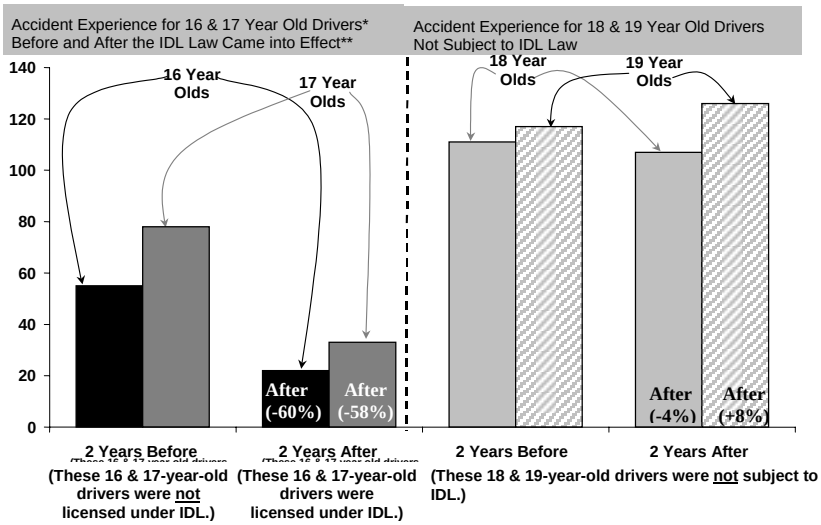
Reducing Highway Deaths, Injuries, and Property Damage

The following data demonstrates the many steps that have been and can be taken to lower the toll of fatalities, injuries, and property damage on our roadways.

Intermediate drivers' license for young drivers

In Washington State, one out of every five people killed in traffic fatalities is a teenager, even though only one driver out of fourteen is a teenager. In response to this trend, the Washington State Legislature passed an Intermediate Drivers' License (IDL) law that went into effect in July 2001. The law requires that the parents or guardians of children under the age of eighteen spend an additional 50 hours of behind-the-wheel driving time in the company of the young driver before they can obtain their drivers licenses. This law also limits how many other teenagers can drive with a newly licensed teen driver and places restrictions on late night driving.

Number of Fatal and Disabling Injury Accidents for 16 to 19 Year Old Drivers* Before and After IDL Law**



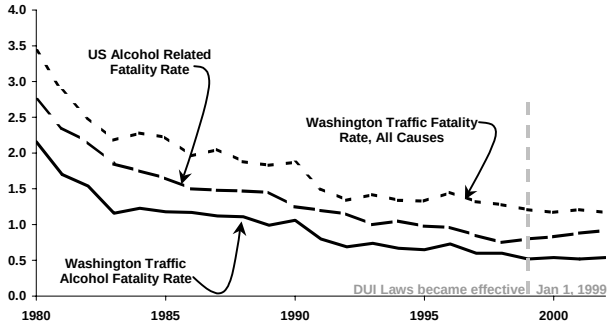
** Collisions on Washington State Highways.*
*** The Intermediate Driver's Licensing Program (IDL) went into effect July 1, 2001.*
Source: Transportation Data Office, WSDOT

Early statistical results show that the IDL law has significantly reduced the number of fatal and disabling injury accidents involving young drivers. Collision statistics collected for the two years after the law went into effect for 16- and 17-year old drivers show a dramatic drop of 60% (in each age group) in the number of fatality and disabling injuries for young drivers. Drivers in the 18-year old group, who were not included in the new law, showed no comparable decline over the years covered by the analysis.

Alcohol limit 0.08

The State Legislature enacted anti-drunk-driving laws in 1998 that lowered the blood alcohol intoxication standard from 0.10 to 0.08 percent and provided for automatic loss of licenses for drunk drivers. The graph to the right shows that in years prior to about 1998, there was a significant drop in the rate of alcohol related traffic fatalities. Since 1998, this rate had remained steady in Washington as well as in United States. Meanwhile, the nationwide rate has increased slightly from the year of its best performance (1998). This data is puzzling in view of the broad perception that the lowered alcohol threshold would, or has, spurred improvement in the drunk driving situation. More investigation is required before WSDOT can confidently suggest the meaning of this data.

Alcohol Related Traffic Fatalities
Washington State's Public Roadway Fatality Rate and Alcohol Related Fatality Rate
Per 100 Million VMT: 1980 – 2002

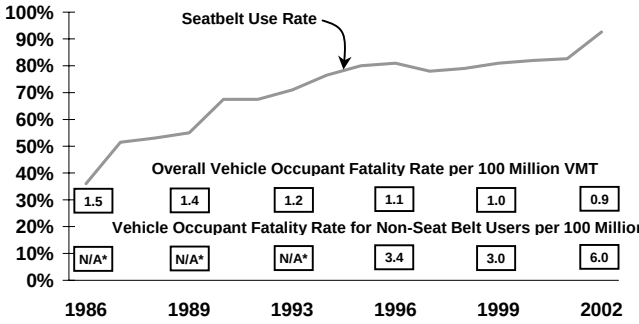


Other measures taken in Washington State to reduce drunk driving include the use of ignition interlock devices (a device attached to the car's ignition system that requires the driver to blow into the device before starting the car; if alcohol is detected the car will not start) and a crackdown on deferred DUI prosecutions.

Seat belts: "Click it or Ticket"

In Washington State, 93% of the occupants of motor vehicles use seat belts (data based on 2002 observation samples; 2003 results are expected to be slightly higher). Half of the fatalities to motor vehicle occupants (48% in 2002 to be precise) are people who were among the 7% of non-seat belt users. Washington State's strong policies in favor of seat belt use for every driver and passenger, required by law, is clearly a strategy for reducing highways deaths and injuries that has proven to be of great value. If the fatality rate for the 7% not using seat belts (approximately 6.3 fatalities per 100 million VMT) could be

Decreasing Vehicle Occupant Fatality Rates Compared to Increasing Seat Belt Use
Per 100 Million VMT: 1986-2002



*In 1993 the calculation formula for vehicle occupant fatality rate of non-seat belt users changed. Motorcycle fatalities were removed from total occupant fatalities. Data prior to 1993 is not available and would be incompatible.

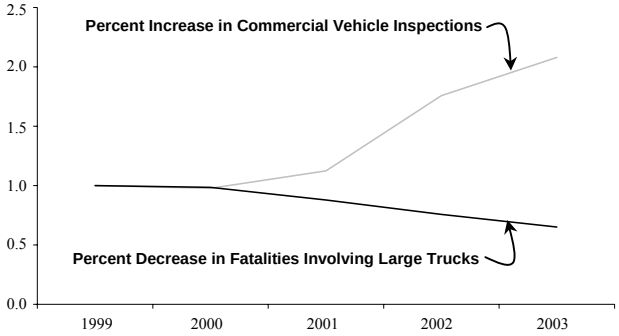
Source: WSDOT Transportation Data Office

reduced to the fatality rate for those who use seat belts, approximately 290 lives per year should be saved from the annual death toll.

Commercial vehicle enforcement and CVISN

Washington State Patrol has, in the years since 2000, significantly increased its enforcement inspection of large trucks. The purposes for these inspections are to: (1) protect the safety of the motoring public by checking truck brakes, lights, and other equipment, drivers' proper licenses, and the size and weights of loads; and (2) protect the highway bridges and pavements by enforcing legal load limits. Truck inspections increased from about 64,000 in 2000 to 116,000 in 2002. Over this period of expanded enforcement, the number of fatalities related to large trucks declined.

Percent Increase in WSP Commercial Vehicle Inspections Compared to Percent Decrease in Fatalities Involving Large Trucks
1999 = 1.00



Source: WSDOT & Washington State Patrol

During that five-year period, WSP also increased the efficiency of its inspection activities by using Commercial Vehicle Information System Network (CVISN) technology to allow trucks with better safety records to bypass inspections, while Weigh-In-Motion (WIM) sensors allowed many truckers to bypass weigh stations. For example, in 2002, 85% of transponder-equipped trucks were waved through inspection at weigh scales, while 30% of non-transponder-equipped trucks were provided the opportunity to bypass on WIM weights alone.

Making Roads Safer

At many locations in Washington State there are opportunities to design and construct roadway improvements that will make roads safer for travelers.

Some of these opportunities are bound up in major road construction initiatives that serve multiple objectives. For example, on I-5 near the Tacoma Dome (one of the highest accident locations in the entire state) planned improvements will extend HOV lane service, add overall roadway capacity, and improve the interchange characteristics for I-5 and SR 16. The result will improve the safety of the road and improve the operation and capacity of the road at the same time. Indeed, new highway construction—always conforming to the current highway design standards or a suitable adaptation derived through sound engineering practice—invariably provides travelers with the benefit of using roads that meet the current expectations for driving safety.

Sometimes safety improvements on a smaller scale (for example, widened or strengthened shoulders or additional turning channels) will be incorporated into a project whose chief objective is routine re-surfacing.

Other projects, often much smaller, have the sole or predominant objective to improve a highway feature from a safety-enhancement vantage point.

Because safety improvement features are incorporated in so many different ways into so many different kinds of WSDOT projects, no comprehensive accounting has been made of the aggregate level of "safety" investments. While not always identified as such, safety investments can be found throughout the capital program, including funding to preserve existing facilities and many small-scale safety investments in the maintenance and operations portion of the budget.

Projects to improve roadway safety that are performed by city and county governments, as well as projects on tribal roads, follow the same pattern as the WSDOT projects. Safety investments are everywhere—often incorporated into projects with many and mixed objectives—and therefore an accounting of all safety investment is virtually impossible at those levels, also.

The Highway Safety Construction Program

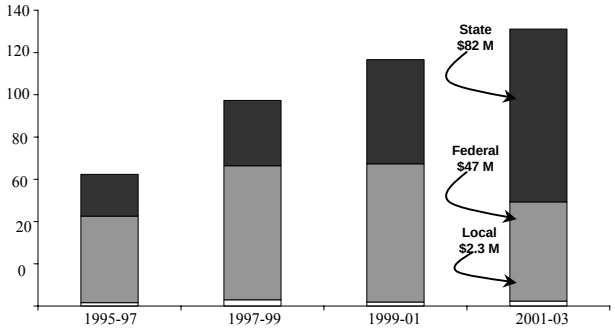
The Highway Safety Construction Program is a specific legislative program designation for safety projects of types illustrated by the following recent examples:

Safety Program Area	Example Project
High Accident Locations (HALs)	SR203 at NE 124th/Novety Road – roundabout
	SR173 at Downing Town site – curve realignment
High Accident Corridors (HACs)	US2 at Sultan/Goldbar – two-way-left-turn-lane
Pedestrian Accident Locations (PALs)	Mukilteo Ferry Terminal – ped. safety enhancement
Traffic Signals	SR515 at SE 217th Street – traffic signal
Channelization (Turn Lanes)	SR24 at Riverside Drive – turn lanes
At-Grade Interchanges	US395 at Hillsboro Street Interchange
Statewide safety initiatives for installation or improvement of bridge rails, cable median barrier, or rumble strips	I-90 Moses Lake West – safety improvements

For the reasons described on the previous page, projects in this program contribute only a portion of the overall investment in making highways safer. In this program the specific purposes are to prevent the risks of accidents occurring and to reduce the incidence or severity of collisions at locations where they have occurred.

Funding for this program has generally been increased by the Legislature in recent biennia. (In the chart on the right, the shrinkage of the federal share is a result of program decisions made within Washington State about the distribution of federal aid dollars among general programs.)

Highway Safety Construction Program
Biennia 1995-97 through 2001-03
8-Year Total, All Sources = $407 Million
In Millions



Source of above chart and graph:
WSDOT Strategic Planning & Programming Office

City and county hazard elimination projects (grant funding)

In recent years, the approximate level of WSDOT funding committed to the hazard elimination program has been:

	1995-1997	1997-1999	1999-2001	2001-2003
Railroad Crossings	6,000,000	6,600,000	7,200,000	7,300,000
Hazard Elimination Program	12,800,000	12,200,000	14,800,000	15,000,000

Although city, county, and tribal transportation agencies do not report transportation funding or projects by type of improvement or revenue, WSDOT believes that local investment in safety as part of total local and tribal transportation funding is similar to the

state projects. The investments made by these agencies show significant safety benefits. A recent WSDOT examination of the benefits of safety programs intended to reduce collisions and fatalities follows.

Safety projects – before-and-after results

Combined Average for 21 Safety Projects
Collisions Per Year

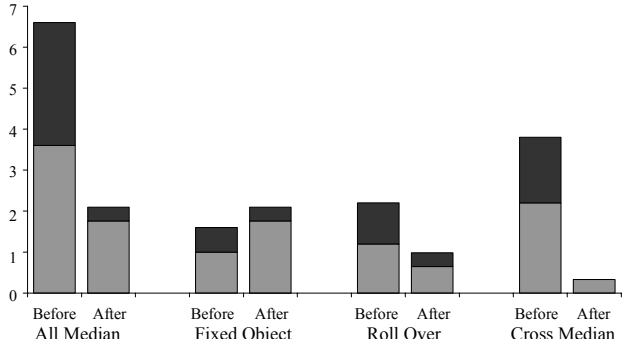
	All Types	Property Damage Only	Injury/Fatal
Before	15.5	8.8	6.7
After	9.7	5.5	4.2

Each year, WSDOT completes a variety of safety improvement projects throughout the state highway system, ranging from adding turn-lanes and signals to installing median barriers and rumble strips. To begin to determine their effect on reducing the number and severity of traffic collisions, a preliminary before-and-after study has been conducted for 21 such projects. Projects were chosen that permitted at least 18 months of collision data to be analyzed in the "before" period and at least 12 months in the "after" period. The data was then normalized (12-month average) to make a fair comparison.[1]

Preliminary results indicate that for this 21-project sample the average number of collisions per year for all projects combined was reduced by 37%. Likewise, the average number of fatal and injury collisions per year also declined by 37%. As additional data becomes available, this safety project analysis will be updated and expanded.[2]

One of the most effective specific treatments has been cable median barrier installation.

Severe Collisions
Before & After Cable Median Barrier Installation
Annual Fatal & Disabling Collisions
by Median Collision Type

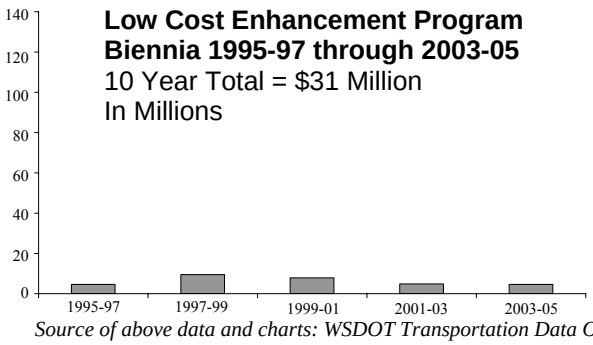


[1] *Gray Notebook* for the quarter ending December 31, 2003.

[2] Ibid.

Highway safety enhancements funded from traffic operations current expense budget

WSDOT Traffic Operation Offices in the six regions across the state perform low-cost enhancement projects using state forces, as opportunities and needs are presented. These are interim "spot" improvements on the highway and they frequently are in response to citizens' safety concerns and suggestions.



Source of above data and charts: WSDOT Transportation Data Office

These safety improvements are often very high benefit/cost projects, especially when compared to more costly construction projects. This program provides an opportunity to solve a problem before it becomes a much higher cost high accident location or corridor.

Low Cost Safety Enhancement Program
Two Sample Project Locations by WSDOT Region
2001 - 2003 Biennium

Region	High Accident Location	Proposed Solutions
Eastern	U.S. 395 Deer Park to Monroe Rd. Deer Park vicinity	Replace substandard recessed pavement markers and install a continuous centerline rumble strip
Eastern	U.S. 2 Eloika Lake Rd., Bridges and Elk Intersection, near Elk (Spokane County).	Improve signing, relocate advance-warning signs, add recessed pavement markers, and convert the truck climbing lane into a two-way left turn lane at Eloika Lake Rd. to Oregon Rd.
North Central	Intersection U.S. 2 and U.S. 97, near Leavenworth	Install rumble strips, right turn arrows and "turn-only" pavement marking on U.S. 97 approaching the intersection with U.S. 2.
North Central	SR 171 and intersections of Ash, Alder and 3rd St. in Moses Lake.	Coordinate the timing of the signals at these three intersections
Northwest	SR 525 Northbound on-ramp from Manor Way, Lynnwood	Install a left turn-only signal for northbound traffic*Signal Ahead* signs, control signs at the intersection of Alderwood Mall Blvd. and Manor Way ,and a*Do Not Enter* sign at the end of the off-ramp. Adjust signal timing and re-evaluate pavement marking location.
Northwest	I-5 Northbound off-ramp to S. Dearborn St., Seattle	Adjust signal timing and install a speed advisory sign and pavement arrows at mid-ramp. Improve signal lighting.
Olympic	SR 3 at Agate Rd. Wye, near Shelton.	Widen and re-stripe to channel left turn traffic away from the main flow.
Olympic	I-5 at Bridgeport Way Southbound off-ramp, Lakewood	Coordinate highway ramp signals with the adjacent city street signal
South Central	I-90 Eastbound, near Snoqualmie Pass	Install overhead*Curve* warning signs and extend the jersey barrier.
South Central	I-90 Westbound, near Snoqualmie Pass	Install overhead*Curve* warning signs.
Southwest	Near SR 14 and Marble Rd., Cape Horn vicinity	Monitor the effectiveness of the improved traffic signs that were installed at this location in 2001.
Southwest	Intersection of SR 432 and SR 433, City of Longview	Install advanced vehicle detection loops (improves traffic signal timing) and advance warning signs.

The fact that a location is listed in the top two high accident locations or corridors does not imply that the location is unsafe or that accidents are related to the design or maintenance of the highway. Crashes are caused by many factors including driver actions, vehicle condition and weather. For each of these locations, discretion is exercised in the development and implementation of proposed solution on the basis of many factors, including level so of

The list above illustrates the variety of low-cost safety enhancement solutions implemented by WSDOT regions. These projects were scheduled to be completed during the 2001-2003 biennium.

Source: WSDOT Transportation Data Office

The *Gray Notebook* for the quarter ending December 31, 2002, contained the following report on the success of the Corridor Safety Program.

Community Corridor Safety Program Gets Results

The Corridor Safety Program is a partnership between WSDOT, the Washington Traffic Safety Commission, and the Washington State Patrol. Local collaboration improves safety in specific corridors, using low-cost approaches and building strong local partnerships. In each locale a committee representing a wide range of interested community members and groups coordinates the effort. The Corridor Safety Program was awarded Governor Locke's *2002 Governor's Award for Public Benefit*.

U.S. 97A between Wenatchee and Chelan
This 40-mile-long U.S. 97A corridor had a high number of single-vehicle accidents. Compared to similar highways in the region, 97A experienced 300% more wildlife collisions, 188% more alcohol-related collisions with 176% more fatalities and disabling injuries, as well as higher percentages of "failure to yield" and "driver inattention" collisions.

The project reduced collisions, injuries and deaths through the "Four Es" – **e**ducation, **e**nforcement, **e**mergency services and **e**ngineering. Highlights of these approaches include:

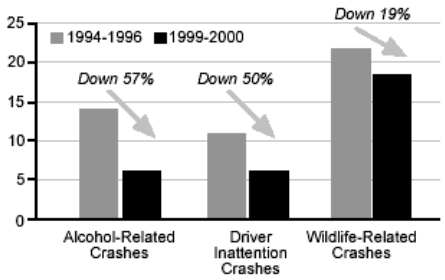
Education
- Presentations to community groups and schools
- Public Safety Announcements
- Project website (active through end of 2001)

Enforcement
- DUI emphasis patrols
- Coordinated multi-jurisdictional law enforcement
- Highway Watch Program

Emergency Services
- Improved use of 911 system
- Development of more incident response teams
- GPS equipment to pinpoint emergency scenes

Engineering
- Additional warning and hazard signs
- Wildlife fences and reflectors
- Enhanced paint striping program
- Attention-getting signing ("Killed by Drunk Driver")

U.S. 97A Reduction in Crashes
1994-1996 vs. 1999-2000 Yearly Averages



Source: WSDOT Traffic Office.

The program is cost-effective: every dollar invested saves approximately $35 in societal costs.

The importance of good highway maintenance and operations for safe highways

The day-to-day function of maintaining and operating highway systems makes a critical contribution to highway safety and to reducing circumstances and conditions that risk giving rise to motor vehicle collisions. These activities, to give just a few examples, include:

- Snow and ice control
- Roadway pavement maintenance and repair
- Guardrail maintenance and repair
- Vegetation management
- Traffic signal maintenance and repair

These activities are discussed in more detail in the Transportation System Efficiencies issue paper.

Two elements of operations that pay safety dividends in special ways are discussed below:

Incident Response Teams

Quickly responding and removing incidents that cause even more congestion has safety benefits of avoiding more secondary collisions that may occur in the backup. This focus on removing incidents quickly is a key element of the joint operating policy statement between the WSDOT and WSP and is showing promising results. More will be developed on the safety benefits of this effort.

Traveler Information System

The Intelligent Transportation System (ITS), which includes traveler information systems, aids traveler safety as well by providing real-time information so travelers can make more informed decisions to avoid congestion and/or unsafe road conditions. ITS also provides weather information needed to make safe decisions about traveling over the mountain passes.

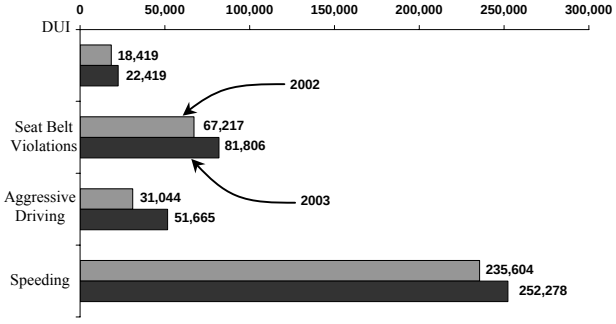
Enforcement

Drivers who disobey traffic laws often cause or contribute to roadway collisions. Roadway location and ownership determines who provides law enforcement on the roadway. For state highways, enforcement is primarily the responsibility of the Washington State Patrol. WSP has focused its enforcement efforts for the last two years in four major areas:

- Driving under the influence of drugs or alcohol
- Seatbelts
- Aggressive driving
- Speeding

However, increased enforcement emphasis by WSP has not, at least in the years 2002 and 2003, been reflected in lowered collision rates for either speed-related collisions or impaired driving (DUI) related collisions.

Contacts Made and Citations Issued by Washington State Patrol
2002 – 2003



Source: WSDOT & Washington State Patrol

Rail Transportation Safety

Passenger rail transportation across the country has a strong safety record with a national accident fatality rate of 0.08 per 100 million passenger miles, about one-tenth that of motor vehicles per 100 million VMT. There is important remaining work to be done, however, to further improve the rail safety record.

The Washington Utilities and Transportation Commission exercises an important oversight function in railroad safety and has excellent information about programs and issues on their web site at http://www.wutc.wa.gov/.

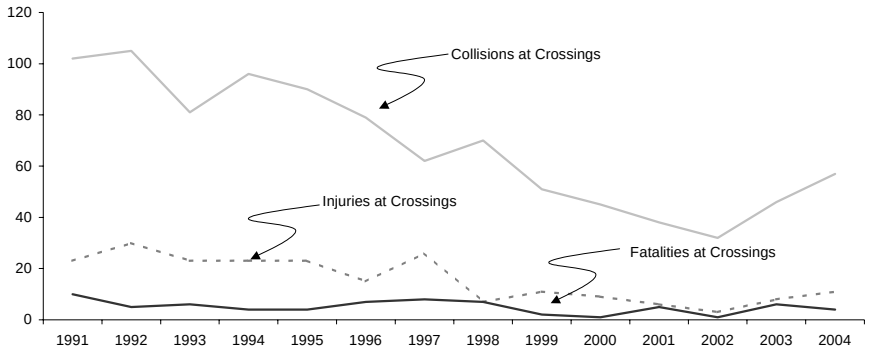
Grade crossings

Railroad crossing safety is an area where much attention has been devoted in recent years by affected communities and the railroads. The results have been positive and dramatic. Since 1992 WSDOT has closed, upgraded, or grade-separated approximately 250 railroad crossings in Washington State. Burlington Northern and Santa Fe Railway Company (BNSF), Washington's largest railroad, has for its part worked to improve safety at its 35,000 railroad crossings. Since the year 2000, BNSF has closed over 1500 crossings throughout its 33,500-mile network spanning large areas of the United States. As a result, BNSF has one of the lowest rates of grade crossing collisions in the rail industry.

Nearly all crossings on busy main line tracks in Washington are now protected by investment in equipment, including flashing lights and gates at railroad crossings to upgrade passive "crossbuck" highways signs. Diagnostic teams have utilized industry "best practices" and state design criteria to recommend crossing upgrades. Using potential exposure factors such as number of tracks, trains, roadway traffic levels, and available funding, the appropriate safety upgrade has been recommended for each crossing.

The chart below shows the number of injury and fatal collisions at railroad crossings has steadily dropped in recent years. In 1992 there were 35 fatal or injury collisions; in 2002 there were 4. While the positive long-term trend is clearly shown in the accompanying chart, 2003 did see a reversal—temporary, it is hoped—as the number of fatal and disabling injury accidents at rail crossings reached 14, a number last seen in 1998.

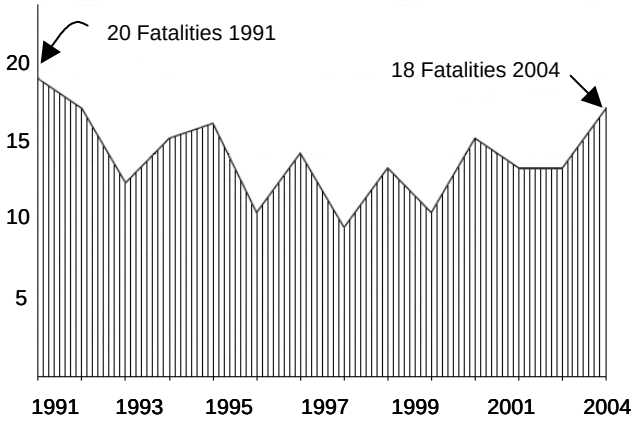
Rail Road Collisions, Injuries and Fatalities at Crossings in Washington State
1991-2004



Trespassing

More people in recent years have been killed while trespassing on Washington State's rail lines than in collisions at grade crossings. In 2004, 20 deaths occurred while trespassing, the same number as in 1991. Suicide plays a significant role in this picture of fatalities.

Fatalities Related to Trespassing on Washington Railroad Properties



Source: Washington Utilities and Trade Commission; Railroad Safety Division

To address the high number of trespassing deaths, "Operation Lifesaver," a program to reduce train collisions with pedestrians and vehicles, is focusing on these areas: engineering, education, and enforcement. Engineering includes what can physically be done to prevent trespassing, such as fencing. Education efforts focus on communicating the impacts and consequences of trespassing on active rail lines. Recently, more enforcement has been used, especially on the BNSF right-of-way between Tacoma and Everett, to discourage the use of railroad right-of-way as a trail to the beach or as a path for jogging or walking the dog.

State safety oversight of rail fixed guideway systems

A recent development regarding safety has been WSDOT's role in the oversight of safety for rail fixed guideway systems. The Federal Transit Administration (FTA) requires states to provide safety oversight for "rail fixed guideway systems" (e.g., light rail and monorail). In 1997, Governor Locke designated WSDOT as the agency to handle this responsibility. In 1999 and 2001, the Legislatures enacted clarification of WSDOT's responsibilities and functions.

There are four main areas of responsibility for WSDOT's safety oversight.

- Review and approve system safety and security program plans developed by each system;
- Conduct triennial safety audits for each system;
- Provide annual safety and security reports to the FTA; and
- When "reportable" accidents or "unacceptable" hazardous conditions occur, oversee the corrective action process.

Today, there are three systems in WSDOT's oversight:

- Tacoma Link,
- Seattle Monorail, and

- Seattle Waterfront Streetcar.

In 2003, WSDOT reviewed and certified the new Tacoma Link System's "Safety and Security Program Plan." They had only one reportable injury: a passenger slipped while leaving a Tacoma Link light rail train.

In the next several years at least two more systems will come under WSDOT's oversight at the time they submit their system safety and security program plans:

- Seattle Monorail Project Green Line, and
- Sound Transit Central Link.

Aviation Safety

Pilot error is the number one cause of general aviation accidents. Weather is also a major contributing factor to aviation crashes both in Washington and the rest of the nation. Other factors include height hazards, hazardous wildlife, and light/glare.

After September 11, 2001, the number of flight-hours in the nation decreased dramatically, contributing to a decline in aviation accidents and fatalities in Washington. However, according to the Federal Aviation Administration (FAA), the number of flight- hours has been increasing since 2003 and is expected to return to pre-9/11 numbers by 2006.

During the time period from 1990 to 2003, Washington experienced a 9% decrease in total general aviation accidents (53 accidents down to 48 with an average of 51 accidents over the 14 year time period). Total fatalities dropped steeply by 64% (22 fatalities down to 8 with an average of 16 fatalities during the same time period). Total accidents having fatalities also declined dramatically by 54% (from 13 accidents involving fatalities down to 6). However, according to a report published by the National Transportation Safety Board, "Annual Review of Aircraft Accident Data, US

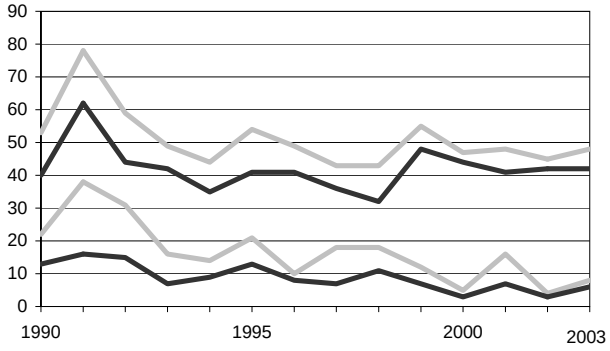
Washington State General Aviation Accidents 1990-2003

	Non-Fatal Accidents	Total Fatalities	Fatal Accidents	Total Accidents
1990	40	22	13	53
1991	62	38	16	78
1992	44	31	15	59
1993	42	16	7	49
1994	35	14	9	44
1995	41	21	13	54
1996	41	10	8	49
1997	36	18	7	43
1998	32	18	11	43
1999	48	12	7	55
2000	44	5	3	47
2001	41	16	7	48
2002	42	4	3	45
2003	42	8	6	48

5% increase in non-fatal accidents
64% decreases in fatalities
54% decrease in fatal accidents
9% decrease overall

Source: National Transportation Safety Board Database

Washington State General Aviation Accidents
1990-2003



Source: Gray Notebook – June 30, 2004

General Aviation, Calendar Year 1999," Washington ranked 6th nationwide, behind Colorado, in the number of general aviation accidents. California, Florida, Texas, and Alaska ranked the highest in the nation with a spread of 136 to 182 accidents–more than twice the number of accidents as Washington.

Decisions related to weather

Top factors in aviation collisions are pilot error and equipment failure. These are best addressed through pilot training. A significant number of general aviation collisions are the result of weather affecting the flight. Useful steps now underway include better provisions of real-time weather information to pilots, better weather information and forecasts for trip planning, and cameras at airports to verify weather information.

Bus Transportation

In Washington State, there are very few deaths associated with bus transportation that occur on a bus or as a result of a bus collision. These low rates of fatalities and severe injuries can be attributed to bus design and effective driver training programs, along with the fact that average bus speeds are comparatively low.

Pedestrians and transit

Of all high *pedestrian* accident locations on SR 99, 80% are within 100 feet of a transit stop. While it may not be that this demonstrates a cause-and-effect relationship bearing on the overall safety of bus transportation, this should be examined further in the search for solutions to pedestrian risk. In the Puget Sound region there are over 120 million passenger boardings each year. Most transit stops are located at a curb and many are along state routes.

A recent University of Washington study based on experiences on state routes in King County determined several statistical relationships to be significant. Bus stop usage was correlated with pedestrian accidents. When bus stop usage increases by 10 people, it increases the odds of that location becoming a pedestrian accident location by 150%.

For each additional 10,000 vehicles a day in the adjacent roadway, odds of that location becoming a pedestrian accident location increase by 180%. For each new lane on a road, the likelihood the location will become a pedestrian accident location is increased 15.3 times. Bus stops are often located along multi-lane roads.

The research makes it clear that facilities with high numbers of bus boardings or alightings should be designed with attention to passengers who have just been or are about to become *pedestrians* with a clear need for being able to safely walk along and across the roadway. Agencies must work together to identify facilities and locations where this issue of intermodal connectivity can be addressed through steps that meet the complicated environment of pedestrian, transit, and roadway systems.

Washington State Ferries

Since 1980, Washington State Ferries (WSF) has assembled a strong safety record. This is true in its record of marine operations and in the operation of its terminals (including the loading and unloading of vehicles and foot and bicycle passengers).

Marine operations

In 2002, WSF operated 29 vessels on 10 routes. It conducted 15,192 sailings and boarded a total of approximately 25.2 million passengers.

The record for passenger safety in relation to vessel operations in 2002 was excellent. There were 100 reported injuries to passengers on WSF vessels and at the terminals. All injuries were minor in nature. There were no disabling injuries.

Vessel crews at WSF hold licenses from the United States Coast Guard to conduct their respective responsibilities. The United States Coast Guard sets safety standards for the vessels (i.e., life boat and/or life raft capacity, navigational equipment, and fire safety equipment).

The record for vessel operations was also excellent. In 2002 there were four hard landing incidents at terminals. Damage inflicted varied but there was no disruption of service at any of the terminals involved and no serious injuries.

The Coast Guard periodically inspects ferry vessels. All vessels were granted a "USCG Certificate of Inspection" (annual inspection of lifesaving and safety systems). This certificate is required to operate the ferry as a public passenger vessel. All vessels also received and passed their interim quarterly inspections.

Terminal operations and vessel loading

WSF conducts operations from 20 terminals. For 2002 the numbers of vehicle and passenger boardings at each of the terminals are shown in the table below:

Washington State Ferries Rider Statistics

January 1, 2002 thru December 31, 2002

Ferry Run	*Total Riders*	*Vehicles*	*Passengers*
Anacortes to Friday Harbor	777,950	319,118	458,832
Anacortes to Lopez	299,580	146,736	152,844
Anacortes to Orcas	608,532	288,558	319,974
Anacortes to Shaw	34,390	16,086	18,304
Anacortes to Sidney, B.C.	137,779	45,640	92,139
Edmonds to Kingston	4,494,660	2,340,373	2,154,287
Fauntleroy to Southworth	888,766	506,193	382,573
Fauntleroy to Vashon	1,940,162	1,122,060	818,102
Interisland	105,268	105,268	
Interisland to Sidney, B.C.	28,225	8,671	19,554
Mukilteo to Clinton	4,137,196	2,238,656	1,898,540
Port Townsend to Keystone	798,291	371,460	426,831
Seattle to Bainbridge Island	6,727,650	2,191,986	4,535,664
Seattle to Bremerton	2,212,150	715,386	1,496,764
Seattle to Bremerton - Passengers Only	681,830		681,830
Seattle to Vashon	66,533	22,305	44,228
Seattle to Vashon - Passengers Only	228,327		228,327
Southworth to Vashon	212,646	129,958	82,688
Tahlequah to Pt. Defiance	761,532	440,808	320,724
System Total	**4,163,018**	**1,308,457**	**2,854,561**

Source: Washington State Ferries

Terminal safety is reflected in the fact that while there were 33 reported injuries at terminals, all injuries were minor in nature (i.e. no disabling injuries).

Security as an Element of Transportation System Safety

Authorities have almost unanimously proclaimed: "September 11th (2001) changed everything." It is certainly true that today's concerns about terrorist attack in the United States have brought new levels of attention in the transportation arena to the following questions:

> *Are transportation facilities and assets (bridges, tunnels, roadways, ferries, airports, or trains) protected as best as reasonably possible against terrorist activity?*
>
> *Are transportation systems prepared to deal with the operational challenges that might be presented in a terrorist emergency, whether directly involving the system itself or indirectly affecting the systems through the burdens that would be placed upon them in the event of an emergency of another kind?*

Transportation system security includes implementing effective protections to prevent harm to transportation systems and their users, and preparing to respond in the aftermath of a terrorist act to assist system users, protect their safety, and recover the use of systems and facilities as rapidly and effectively as possible.

It is also true that many of the issues prompted by terrorist concerns have, to one extent or another, always been presented by the possibility of natural or man-made disaster. Speculative examples include: a lahar (a mudflow composed of volcanic debris and water) on Mt. Rainier, a road- and rail-destroying earthquake, a serious accident involving a truck or train car with a cargo of hazardous chemicals, a tsunami on the Pacific Coast, a barge strike on a Columbia River bridge pier, or a regional power black-out from a computer malfunction. The challenges of protection and preparedness for transportation systems have many similarities with local or regional challenges from threats or acts of terrorism.

In every respect the fundamental issues are safety of the system and the safety of system users.

Agency and inter-agency transportation system preparedness

Major new emphasis must be placed on integrating emergency management between local, regional, and statewide levels and the adequacy, security, and interconnection of operations centers and emergency management centers.

The general areas in which work remains to be done include:

- Strengthening and making more reliable under stressed circumstances all aspects of emergency communications including interoperability of communications systems among public safety, emergency management, and transportation system personnel.

- Increasing the physical protection of communication sites and systems and supplying redundancy for critical components.

- Increasing the protection of critical computer and Internet-based operating systems. This also includes planning to achieve system redundancies and system and/or facility recovery.

Some of the areas where work needs to be done are very specific. For example, there is a need for additional marine fire-fighting capability on Puget Sound—contingency planning, mutual aid agreements, and coordination with the Puget Sound Marine Firefighters Commission.

Other areas in which the safety and security needs of the transportation system must be addressed involve everyday operations. These programs build on WSDOT's decade-long experience with its *Transportation Disaster Plan* first prepared in 1993 in support of the *Washington State Comprehensive Emergency Management Plan*. This plan provides a framework for preparation for and response to natural and human caused events.

Today's security emphasis requires agencies to focus on emergency drills and exercises. One important opportunity is to follow and expand on the state's experience in an annual statewide earthquake readiness exercise conducted each April. WSDOT, in addition to participating in the annual earthquake exercise is now, in the fall, conducting a terrorist event exercise. The Fall 2004 event was planned with support from the U.S. Department of Defense Center for Asymmetric Warfare. WSDOT also participates in exercises sponsored by the Washington Emergency Management Division (for example: Umatilla Chemical Stockpile and the Hanford Columbia Generating Station).

Programs for Incident Command System (ICS) training and drilling need to continue and to be given even greater attention. The federal Department of Homeland Security now requires that state and local governments adopt the ICS for all field and emergency operation centers. Washington State Patrol has developed and delivered two statewide ICS classes for WSDOT employees with traffic Incident Response Team and Emergency Operations Center responsibilities. Security awareness programs for employees recommended by the American Association of State Highway and Transportation Officials (AASHTO) have also been accomplished. WSDOT's *Eyes and Ears* brochure for employees was prepared and distributed shortly after September 11th along with basic curricula for instructing employees and their family members about disaster preparation and response.

Other areas for continued attention are stockpiling of equipment and materials and making provisions for emergency procurement of assistance from contractors and vendors. WSDOT's practices in these areas should be reviewed and updated on a frequent basis to assure that they are sufficient for the increased state of readiness that today's security concerns require.

Threats to Specific Structures and Facilities

Vulnerability assessment

WSDOT is conducting a vulnerability assessment to its transportation assets (candidates would include bridges, tunnels, or ferry vessels). This will support the development of measures, together with associated investment needs, to deter, delay, detect, or avoid an attack by reducing the probability that an attack would be successful or by reducing the likely impacts of an attack. The Washington State Patrol, National Guard, Federal Highway Administration, and the U.S. Army Corps of Engineers all support this assessment.

The first phase is complete and identifies a short list of Washington's most critical transportation assets. The assessment has generated investment proposals of approximately $14 million to support security needs. This does not include needs of the Washington State Ferries, where an assessment is being developed in cooperation with the U.S. Coast Guard.

The second phase of the assessment will produce a similar analysis for the next highest priority transportation assets.

Security Issues for Particular Transportation Modes and Facilities

Managing roadway and rail systems against risks presented by transport of hazardous or explosive cargos

In Washington State, about 302 trips are made each day by large gasoline tank trucks with 123 additional trips made by trucks carrying other forms of hazardous or explosive materials (aviation fuel, fuel oils, liquefied natural gas, etc.). These cargos present dangers of explosion or the potential dispersion of dangerous or deadly materials to land, water, or air. Risks are presented not only when the cargos are in transit, but also at the points where they are loaded or off-loaded often with little protection for their security.

In recent years, regulations and U.S. Department of Transportation supervision of the movement of hazardous cargos have become a major focus. For example, CVISN technology has been enhanced to increase capability of tracking the movements of particular hazardous cargo trucks. Other steps are underway to improve the tracking of specific truck drivers. The threat of terrorists using a commercial truck to transport dangerous or hazardous material as a weapon is all too real. Cargo surveillance at the U.S./Canada border crossings along Washington State's northern boundary has also received attention.

Protecting the Washington State Ferry System

The primary security issue for WSF is passenger safety. Concern that a ferry, here or somewhere else in the United States, could be a target reflects the obvious fact that the vessels often carry hundreds of passengers.

The Maritime Transportation Security Act of 2002, signed by President Bush in November 2002, has guided much of the work of security assessment and preparation for WSF. In October 2003, the U.S. Coast Guard adopted implementing regulations. The International Maritime Organization in its 2002 adoption of the International Ship and Port Security (ISPS) Code, meanwhile, had taken parallel steps. These federal regulations and international standards are very similar and WSF operates under both.

In late 2003, WSF submitted a security plan to the U.S. Coast Guard under the provisions of the new regulations. This plan has received interim U.S. Coast Guard approval and is now being implemented. Under the plan and following WSF's own management initiatives, WSF designates a company security office, vessel security officers for each vessel and regional facility security officers. Detailed procedures are in place with law enforcement and the Coast Guard for response to concerns, threats and incidents. Training, drills, and exercises for crew will be integrated into WSF's on-going program of crew drills. Video monitoring capability is being established for designated "public access areas" to meet requirements related to passenger checks and screening of hand-carried items. Cost of the investments necessary to implement this monitoring system is being defrayed in part through the federal Port Security Grant Program. On-scene presence of law enforcement is provided through arrangements with WSP that include vessel boardings/ferry rides, vehicle screening at terminals, commercial vehicle enforcement (CVE) exams, bomb-dog team sweeps, other visible uniformed presence, and emergency response procedures.

Security preparation for transit systems

Transit systems in Washington State are adhering to and implementing a variety of steps recommended by the Federal Transit Administration (FTA) to enhance public transit security. These include training transit employers and supervisors, improving emergency preparedness, and increasing public awareness of security issues.

A new FTA program called "Transit Watch" is a safety and security awareness program designed to encourage the active participation of transit passengers and employees in maintaining a safe transit environment. The program was piloted last year in Mason County in Washington State.

FTA has also established guidelines on how transit systems should respond to Homeland Security threat level designations and has recommended twenty action items for incorporation into transit agency system security program plans.

Passenger rail

Rail passenger travel provides special security challenges. Trains have frequent stops, with multiple opportunities for passengers and cargo to access or leave the train while en route. Federal authorities have made clear that security systems for passenger trains will have to use a different model than the systems put in place for airline travel.

Security procedures for Amtrak trains have been developed that respond to the varied designations of threat level employed by the federal Department of Homeland Security. The Department of Homeland Security and the Federal Railroad Administration conduct regular audits of Amtrak emergency preparedness. Emergency preparedness exercises include a joint exercise performed with Sound Transit in April 2004. Employees have been trained to identify suspicious activities and to implement procedures for dealing with threat situations. Enhanced security patrols have been implemented at stations and special practices are in place to secure equipment in yard facilities. WSDOT cooperated with Amtrak to upgrade video surveillance at facilities without staff. Photo identification for matching with ticketed passenger names is in place; all seats on Amtrak trains in Washington State require reservations and there are no ticket sales on board the train.

General aviation airports

Shortly after September 11th, 2001, WSDOT Aviation initiated a study and formed a task force to address general aviation security. Many general aviation airports are sited in broadly accessible locations but many others are located in semi-isolated areas. This isolation potentially makes them likelier to be used as instruments of terrorism than as terrorist targets. The scenario of greatest concern in regard to these general aviation airports is that a small aircraft operating from the airport could conduct a terrorist act by, for example, releasing into the atmosphere a chemical or biological agent over a populated area. Local services and facilities, level of use, and local financial conditions

vary considerably for each airport. Security measures must be balanced against the convenience of operations that draws pilots to these airports.

To date, the federal government has not required specific security measures to be taken at general aviation airports. WSDOT, through its Aviation Division, created an airport security task force made up of airport officials, pilots and state and federal officials to consider security recommendations for general aviation airports in Washington State. This led to WSDOT publication of "General Aviation Security Guidelines." These security guidelines identify good business practices for security protection at general aviation airports and provide an inventory of security and vulnerability issues for each of the 129 airports within the aviation system plan. The security guidelines also recommend that general aviation airports conduct an individualized security assessment to identify airport security needs, financial resources, and security plans that contain realistic provisions fitting within the financial resources for each airport. The security assessment would look at a variety of issues including perimeter access, availability of lighting and signage, and locking of hangars.

The following issues are highlights of the Aviation Security Guidelines that airports should consider during security assessment & planning:

- **Threat Recognition**: Threat recognition has to do with being aware of those facilities that make the airport most vulnerable (i.e., aerial applicators, fuel facilities, and potentially dangerous facilities adjacent to the airport such as an explosives plant, etc.).

- **Airport Security Assessment:** Airports are encouraged to conduct individual assessments for each airport. WSDOT can provide technical assistance for these assessments upon request. Aviation state aide grants are available to assist in implementing security improvements identified in the individualized assessment.

- **Reporting and Response Plan**: Airports need to develop a reporting and response plan that is based on an established communication network. This often means relying primarily on trained airport users' willingness to be vigilant and report unusual airport activity to the local authorities.

- **Policies and Procedures**: Airports should develop policies and procedures to improve response to security issues. This could be through enhanced education and special meetings and could address issues such as pilot registration, locking and securing aircraft and materials, improving signage, restricting access, and so forth.

- **Security Facilities and Systems**: Security facilities and systems are comprised of the actual physical improvements implemented to improve security, including but not limited to fencing and gates, lighting, and

protective barriers to restrict access to allow only legitimate airport users right of entry.

- **Other Suggestions**:
  - Signing critical areas to raise security awareness and limit access to authorized users.
  - Installing lighting in strategic locations, including fueling facilities, hangars, and terminal buildings.
  - Providing surveillance cameras to monitor strategic locations.
  - Fencing fueling facilities and providing automated pedestrian gates that allow only authorized users to access the pumps.

Conclusion

An analysis of the history of safety issues in relation to Washington's transportation system leads to the following conclusions and recommendations:

- Behavioral approaches will be a significant part of the strategy to address impaired driving, seat belt use, speeding, aggressive driving, and other contributing driver behaviors. WSDOT and the Washington Traffic Safety Commission are working together to evaluate the effectiveness of potential behavioral countermeasures.
- Roadway safety conditions on rural two-lane roadways can and should be addressed. Strategies such as increased enforcement, centerline and edge rumble-strips, and improved shoulders and roadsides are being evaluated. Also, cable median barriers and rumble-strips on Interstates are proving to be cost-effective solutions.
- Pedestrians, bicyclists, and motorcyclists are disproportionately represented in fatality rates and need to be addressed in the safety strategy.
- Stepped up efforts to prevent railroad trespassing, such as Operation Lifesaver, are needed.
- Improved weather information access at general aviation airports is needed to help pilots make good flight decisions.
- Better understanding of data should help target safety efforts where they will have the most effect.

Glossary of Terms

AASHTO: American Association of State Highway & Transportation Officials

At-Grade: Refers to competing transportation systems that share the same plane; for example, the intersection of rail and highways where there is no tunnel or bridge

BNSF: Burlington Northern and Santa Fe

Channelization: The separation or regulation of conflicting traffic movements

CVE: Commercial Vehicle Enforcement

CVISN: Commercial Vehicle Information Systems Networks: Department of Licensing, Washington State Patrol and WSDOT use technology to avoid the need to stop trucks at weigh stations to check vehicle compliance; See also: http://www.cvisn.wsdot.wa.gov

DUI: Driving under the influence of alcohol, drugs or other impairing substances (see RCW 46.61.502)

Expressway: WAC 468-70-020 (3) "Expressway" shall mean a divided arterial highway for through traffic with partial control of access and grade separations at most major intersections

FAA: Federal Aviation Administration

FTA: Federal Transit Administration

GA: General Aviation airport

Geometrics: Combination of a roadway's lane and shoulder width, vertical and horizontal alignment

Golden Hour: Defined by emergency medical personnel as the first 60 minutes of intensive care during which it is possible to save the life of an injured or traumatized person

HAC: High Accident Corridor: A highway corridor one mile or greater in length where a five-year analysis of collision history indicates that the section has higher than average collision and severity factors

HAL: High Accident Location: A highway section typically less than one-quarter of a mile where a two-year analysis of collision history indicates that the section has a significantly higher than average collision and severity rate

ICS: Incident Command System: A standardized on-scene emergency management structure that is able to integrate multiple organizations with different jurisdictional boundaries, according to the complexity and demands of single or multiple incidents

IDL: Intermediate Driving License: A conditional driving license utilized prior to obtaining a driving license

Intermodal connectivity: Refers to the ease of connection when people or freight must change modes of transport (e.g., ship to rail, transit to air)

Interoperability of communication systems: Refers to the ability to communicate between disparate radio systems

Interstate: The Dwight D. Eisenhower National System of Interstate and Defense Highways, commonly called the Interstate Highway System; with very few exceptions, these are controlled-access freeways, allowing for safe high-speed driving when traffic permits

ISPS: International Ship and Port Security Code: comprehensive security regime establishing an international framework of co-operation between governments, government agencies, and the shipping and port industries in order to detect and take preventive measures against security incidents affecting ships or port facilities used in international trade

ITS: Intelligent Transportation System: the application of advanced electronics and computer technology to automate highway and vehicle systems to enable more efficient and safer use of existing highways

PAL: Pedestrian Accident Locations: sections of roadways with four or more pedestrian collisions with vehicles in a six-year period

Rail Fixed Guideway System: Any light, heavy, or rapid rail system, monorail, inclined plane, funicular, trolley, or automated guideway that is: (1) included in FTA's calculation of fixed guideway route miles or receives funding under FTA's formula program for urbanized areas (49 U.S.C. 5336); and (2) not regulated by the Federal Railroad Administration (49 CFR Part 659)

Rural: Unincorporated or incorporated areas with total population less than 10,000 people or with a population density of less than 1,000 people per square mile

Suburban: Unincorporated or incorporated areas with total population of 10,000 to 29,999 or any area with a population density of 1,000 to 2,000 people per square mile

UTC: Washington State Utilities & Transportation Commission

Urban: Incorporated areas over 30,000 or an incorporated area of at least 10,000 people and a population density over 2,000 people per square mile

VMT: Vehicle Miles Traveled

WIM: Weigh-in-Motion: systems used to measure commercial vehicles, most importantly axle length and truck weight while the truck is moving.

WSDOT: Washington State Department of Transportation

WSF: Washington State Ferries, a division of WSDOT

WSP: Washington State Patrol